

First watering of the day

you should saturate the block/slab, with a good amount of drainage. This ensures that you get the old depleted plant food flushed out. If you water less than daily, then flush each time you water.

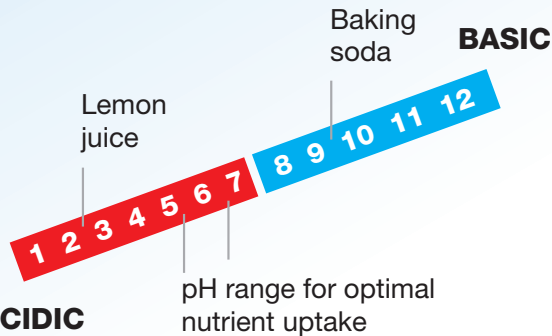
Start watering at sunrise,
water when the first light shines on the plant.

Stop watering

2-3 hours before sunset or before turning the lights off. Keeping **Grodan** drier at night helps prevent root problems and makes for a more generative plant (better blooming, better setting of fruits).

Basic concepts pH

Below you will find an illustration of the basic pH concepts.



When your propagated plants have grown into the bigger Delta blocks, they will often go into a period of rapid growth. The resulting growth often leads to increases in pH and EC [Electrical Conductivity] or what is sometimes measured in Total Dissolved Solids [TDS].

Basic concepts EC (Rule of thumb only)

EC		APPROXIMATE TDS (ppm)
0.5 - 1.5	Propagation	250 - 750
1.5 - 2.0	Mature plant starving	750 - 1,000
2.0 - 3.0	Optimal	1,000 - 1,500
3.0 - 5.0	Too much	1,500 - 2,500
5.0 plus	Damage	2,500 plus

* EC measures only fertilizer salts, whereas TDS measures all dissolved solids. TDS is based on a conversion of EC (the conversion factors can vary). For these reasons, we recommend EC for accurate nutrient measurements and not TDS.

Avoid drastic environmental changes

which can contribute unwanted shock or stress to the plant. Whenever possible consider gradual changes to plant influences such as nutrient solution formulations, lighting period/intensity or temperature.

Be sure to **water the blocks well**, and frequently monitor the EC and pH of the solution in the block. This is even more important for non-top irrigation applications such as Ebb & Flood systems. The best way to retrieve solution samples from the stonewool is by use of a plastic syringe. Your local authorized **Grodan** supplier should have them for sale.

As a general rule, you will not need to water the newly transplanted **Grodan** Delta block for the first few days.

- Always use pH adjusted water with plant food.
- Never let the Grodan go bone dry.
- No light : No water-the plants are resting.
- Make sure that the slab or block can drain freely - avoiding situations where the stonewool is sitting in water.



ESPAÑOL

Please visit our web site
www.hydroponics101.com



FRANÇAIS

- To find more information.
- To ask us questions.
- To locate a **Grodan** dealer.

Your local store:

Classified by World Health Organization as a bio-soluble product. MSDS available on above website. International cert. ISO 9000 & 14001 and EMAS
All information/advice has been compiled with the greatest care and in accordance with the latest knowledge at writing; however we are unable to assume any liability for the use of the contents.



Soak



pH Conditioning & Watering Tips

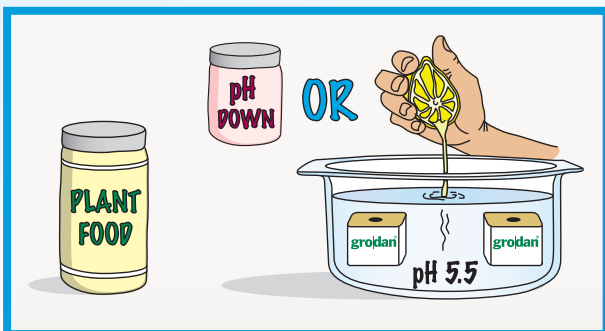
Grodan® Stonewool pH Neutral!

When stonewool is initially soaked, there is a spike in pH because of the residual lime left inside the fibers. This has led to a mistaken belief that Grodan is alkaline and that one has to continuously adjust pH. In fact, once the lime is flushed out, stonewool is pH neutral.

How to pH condition:

1. Saturate stonewool in no lower* than pH 5.5 water for about a half hour.
2. Remove and let drain to waste.
3. Flush through the stonewool with nutrient solution also at pH 5.5, just prior to planting or sowing.

***Note:** If you condition Grodan products at pH lower than 5, you may damage the stonewool fibers. To be on the safe side, DO NOT go below pH 5.5. Also, optimum plant growth occurs between pH 5.5 - 6.5.



Lower pH Organically: Use the juice from 1/2 a lemon/gallon of water to lower the pH of water by one point- eg. from pH 7 to pH 6.

Why does pH change?

- When the plant grows the pH goes up because of the root activity involved in nutrient uptake of the plant.
- When pH goes up it is a good sign; your plant is actively growing!
- With most plants at fruit and flower setting, the pH will briefly drop and it is time to change to your bloom solution.

Routinely check the pH in your stock tank to make sure it is within the correct range.

How Frequently to Water?				
Product	Plant Age	Ebb/Flood System	Drip/Top Irrigation	Outdoor Hand Watering
Blocks	Young plants	1 every other day to 1 per day	Once per day	Once per day till you see drain water
	Older plants	1-4 times per day	2-6 times per day	Time to pot up into a container
HUGO	Young plants	Once every 3-5 days	Once per day	Once every 2-3 days
	Older plants	1-2 times day	2-6 times per day	1-3 times per day
Slabs	Young plants	Once every 3-5 days	Once per day	N/A
	Older plants	1-3 times per day	2-6 times per day	N/A
Granulate or Growcubes?	Indoors we suggest Growcubes - they can't be over watered. Outdoors Absorbent Granulate stays wetter: In 5 gallon container of Granulate, water young plants weekly and older plants every 3 days.			

How much to water depends on many factors such as light intensity and plant size. Use the charts only as a starting point. Watch the plants and adjust as needed. Please see further tips on next page.

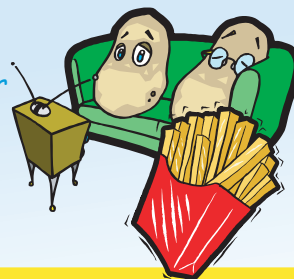
Under strong light with top irrigation, you need less volume but more frequency of watering: Water at 25% of the stonewool volume per plant with frequent watering.

Under lower light, you need more volume but less frequency of watering: Water at 75% of the stonewool volume per plant with much less frequent watering.

In an ebb and flood system the only choice is "100%" water volume each time the system is flooded. (See chart on the right for volumes). →



Don't make your plant a couch potato! Less water is better. Too much water causes your plants to get lazy and weak. How would you feel if you got 3 courses for each meal?



Kick the Bucket Method

Easy test for container plants in Grodan: Lightly kick container, if the pot moves you water!



How Much to Water?

Product	Volume cups/L	25% Oz/dL	75% Oz/dL
Delta 4	2 / 0.4	4 / 1	1.5 / 3
Delta 5.6	2.75 / 0.56	5.5 / 1.4	16.5 / 4.2
Delta 6.5	3.25 / 0.65	6.5 / 1.63	19.5 / 4.88
Delta 8	4 / 0.8	8 / 2	24 / 6
Delta 10	5 / 1.0	10 / 2.5	30 / 7.5
Hugo	16 / 3.2	32 / 8	96 / 24
6" Expert x 36"	42.8 / 10.13	10.7 cups / 2.53 L	32 cups / 7.6 L
8" Expert x 36"	57 / 13.50	14.25 cups / 2.5	42.7 cups / 10.13 L

Use chart above for volumes:

To calculate volumes, we simply divided the block number by 2. e.g. Delta 10 ÷ 2 = 5 cups of water; approx. 1 L. For ease of use we have set a liter to equal 5 cups except for the slabs.