

## Hygiene Management in Horticulture

Hygiene Management is a basic prerequisite for successful plant production. The observance and implementation of the hygiene measures described below is indispensable for a reliable harvest.

### Propagation (Cultivation of Cuttings and Seedlings)

1. Prepare a 1:50 dilution
2. When using seeds: soak seeds in this 1:50 solution for 8-24 h
3. Once per day, lift the lid of the propagator and spray the 1:50 solution onto the cuttings/seedlings until dripping wet
4. Allow to dry and close lid again

### Plant growth and bloom (week 1 - final week)

1. Prepare a 1:50 dilution
2. Spray this dilution directly on the plant to protect it preventively against pathogens and to stimulate its immune system ("Priming Effect")

Prophylactic treatment: 2-3 times per week with a 1:50 dilution

We recommend the prophylactic treatment as this is the only way to ensure the continuous health and strength of your plants.

Acute treatment: Once per day with a dilution up to 1:4 for approx. 1 week.

After that period, switch to the prophylactic treatment.

In the case of an existing infestation (e. g. with mildew), a short-term treatment with the high dosage is required.

#### Note:

- Any prepared dilution must be used up as soon as possible, and no later than 48 hours after its preparation. Keep in a tightly sealed container and out of UV light.
- Always use purified water for spraying/nebulizing (e. g. distilled water, deionized water or osmosis water). We recommend commercial pressure sprayers with a pressure of min. 3 bar.
- Where the plants are cultivated under artificial light, the spraying/nebulizing should be carried out right before or during the photoperiod, however, the production lights must always be switched off.
- The production lights need to stay switched off for 20-30 minutes after spraying. One 4 watt LED per 3 m<sup>2</sup> is sufficient to keep the plants in the photoperiod during that time.
- For outdoor applications, spraying/nebulizing should be carried out exclusively in the morning and evening to avoid direct sunlight/UV light.

### Priming Effect and VPD

Recent research showed that the plant is protected due to two very effective mechanisms:

- a) the external anti-microbial protective effect
- b) the plant is induced to form defense proteins (so-called „priming“) which will further boost the plant's resilience from within. Interestingly, this effect is even more remarkable if the application is repeated several times.

Follow the first link to learn how successful indoor cultivators can adjust the climate to their advantage using the Priming Effect.

Adjusting the climate parameters suggested in the article provides the following benefits:

- ✓ A boost in cell production, which leads to significant yield increases
- ✓ Little to no pest infestations, especially with spider mites
- ✓ Preservation of valuable terpenes

In the second link, you will find a VPD table, which shows the actual maximum values for temperature and humidity you can use. This table is a valuable tool for you to use in practice and optimize your climate to get the maximum out of your plants' genetic predisposition.



Scan to the article

To use the innovative climate parameters in this VPD table,  
we spray a 1:25 dilution twice a week  
from when the plants are set, right until the harvest.



Scan to the VPD table

## Cutting Production

1. Disinfect your hands
2. Disinfect your equipment (scalpel, scissors, etc.) with a 1:50 dilution
3. Disinfect the cutting plugs by soaking them with a 1:100 dilution
  - > Of course, a 1:50 would work, as well, but is not necessary for this purpose
  - > Time for soaking the plugs according to instructions of manufacturer
4. Disinfect your mother plant by spraying a 1:50 dilution
5. Avoid smoking during cutting production (Keyword: Tobacco Mosaic Virus)
6. When cutting the cutting from the mother plant immediately place the cutting in a 1:50 dilution for 1-24h  
Expert advice: store the container with the cuttings in a refrigerator at a temperature of 4-6 °C/ 39-43 °F

Note: Combination with all common rooting aids possible.

## Hydroponic systems

1. First, mix the required amount (see below) with 1 litre of water
2. Add the mix to the water tank or the nutrient solution

The treatment can be carried out during the regular operation of the system, i.e., while the plants are in the system.

Prophylactic treatment: 5-10 ml per 10 litres of water

We recommend the prophylactic treatment, as only this treatment prevents the contamination of the water.

Acute treatment: 20-40 ml per 10 litres of water

For treating an existing water contamination.

### Note:

At water temperatures lower than 23 °C (74 °F), apply once a week with the lower dosage.

At water temperatures above 23 °C (74 °F), apply twice a week with the higher dosage.

We highly recommend preventive use!

The simultaneous use of organic fertilizers and/or microbes is not advisable. Thus, we recommend in this case to add the organic fertilizers and/or microbes not sooner than 2 hours after disinfecting the system (so you can be sure that only the desired microorganisms will grow in the system).

Expert advice: Since pathogens such as bacteria, fungi and viruses are spread over the irrigation water, clean and germ-free water is a top priority.

## Dilutions

<b>Dilution</b>	<b>1 L</b>	<b>10 L</b>	<b>100 L</b>	<b>500 L</b>	<b>Change of EC value*</b>
1:4	250 ml + 750 ml	2,5 l + 7,5 l	25 l + 75 l	125 l + 375 l	N/A
1:10	100 ml + 900 ml	1 l + 9 l	10 l + 90 l	50 l + 450 l	N/A
1:25	40 ml + 960 ml	400 ml + 9,6 l	4 l + 96 l	20 l + 480 l	N/A
1:50	20 ml + 980 ml	200 ml + 9,8 l	2 l + 98 l	10 l + 490 l	N/A
1:100	10 ml + 990 ml	100 ml + 9,9 l	1 l + 99 l	5 l + 495 l	N/A
1:250	4 ml + 996 ml	40 ml + 10 l	400 ml + 100 l	2 l + 498 l	+ 0,12 (critical)
1:500	2 ml + 998 l	20 ml + 10 l	200 ml + 100 l	1 l + 499 l	+ 0,06
1:1000	1 ml + 1 l	10 ml + 10 l	100 ml + 100 l	500 ml + 500 l	+ 0,04
1:2000	0,5 ml + 1 l	5 ml + 10 l	50 ml + 100 l	250 ml + 500 l	+ 0,02

\*This parameter is relevant for use in hydroponic systems only. Slight decrease in pH at the dilutions given above can be expected.

## Conclusion

If the hygiene measures described above are adhered to, the use of pesticides can generally be omitted.

## **Clean cultivation = Reliable harvest**