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# Hygiene measures in greenhouse horticulture

The impact of a plant disease on a greenhouse farm can be enormous. Such a disease can be brought into the company in various ways: through people, water, materials and tools and starting material. Hygiene measures reduce the risk of contamination of the crop and are thus essential components for the quality of the crop and production. But how do you determine the state of the hygiene at a company? What do you have to take into account? And how do you achieve the most optimal hygiene state?

In this white paper we list all the points of attention concerning hygiene, cleaning and disinfection. Do you have any questions about the white paper? Then please contact with the hygiene & disinfection product specialist [Jasper Verhoeven](#).



**Reduces the  
chance of  
contamination**



# Performing a disinfection scan

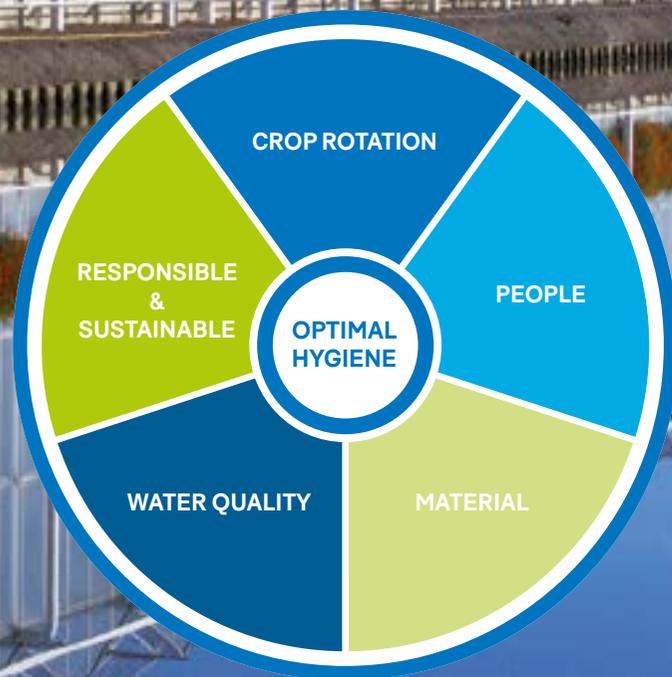
Cleaning and disinfection contribute to a strong company hygiene. In order to map the state of hygiene in the company, you can perform a disinfection scan. By mapping the risks per pillar, you are able to optimize the hygiene in your company. It is important that the risk analysis considers all five pillars. In this way, the optimal level of company hygiene can be guaranteed. Subsequently, make sure that these points are checked regularly.

## Crop rotation

- Is the greenhouse, cultivation table or department cleaned and disinfected every time it is empty?
- What happens to the crop residues?
- Are agents used that are aggressive to materials?

## Persons

- Which hygienic measures regarding hand and foot disinfection are taken at the company?
- Which hygiene measures are taken at the farm with regard to clothing?
- Are there employees at the company who work at different locations? If so, what are the hazards that they may transmit?
- Are employees aware of the hygiene protocol in force at the company?
- Do I know who has visited the company (visitor registration)?
- What is the procedure for disinfecting and 'dressing' visitors?
- Are visitors informed about the hygiene protocol in force within the company?





## Materials

- How are materials that enter the company from outside handled (think of Danish carts, for example)?
- Are materials exchanged between different departments/ compartments?
- Is frequently used material cleaned at the appropriate frequency?
- Are tools cleaned with the correct agents and concentrations?

## Water quality

- Is water disinfection applied in the form of an UV-filter, dosing of Huwa-San or heating? If so, is it working optimally?
- Is the watering system clean (is there no biofilm)?
- Are there pathogens that are easily spread through the water and pose a danger for my crop?
- Are there times in the year when there is a water shortage? How do you supplement this shortage and what are the risks of this (e.g. with ditch water)?

## Responsible and sustainable

- Are the products that are used officially permitted for the relevant application?
- Are the pesticides used safe for my personnel?
- How harmful are the pesticides to the environment?

You have direct influence on the above 5 pillars. In addition, it is important that you do not do anything through the starting material. Therefore, check how the hygiene is arranged at the company from which the starting material comes and what the possible risks are during transport.

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# Creating a hygiene plan

Are the results of the disinfection scan known? The next step is to create a hygiene plan in which the five pillars (crop rotation of people, materials, water quality and Responsible & Sustainable) are included. A hygiene plan contains a description of the hygiene measures taken in the company and how often and/or at what times these measures must be taken. Every crop has to deal with specific diseases situations. A hygiene plan is therefore always customized.

Despite the fact that a hygiene plan is custom-made, you can take measures for the following points:

- Crop rotation: crop rotation is an excellent opportunity to thoroughly clean and disinfect everything. During the crop rotation you want to make sure that all diseases from the old crop are to prevent them from infecting the new crop. It is important to look at the products you use and the approach you take. Consider, for example, the work sequence.
- Persons: among other things, hygiene measures with regard to **hand** and foot disinfection, the wearing of clothing such as overalls and a hygiene protocol for visitors reduce the risk of infection through people.



**Customized  
work**

- Materials: [cleaning the used materials](#) on a regular basis, reduces the chance of contamination through these materials. The lower concentrations are, the smaller the chance of contamination.
- Water: applying water disinfection in the form of UV-filters, heating or using the dosage of Huwa-San, reduces the chance of spreading and contaminating water.
- Responsible & Durable: besides the fact that a product must work, it is also important that it is sustainable and falls within the laws and regulations. Therefore, always check whether resources are used in the right way.

## Complying with a hygiene plan in horticulture

If you have created a hygiene plan for your company, complying with the hygiene plan is the next step. Make sure that both employees and visitors (including suppliers) of the company are aware of the applicable hygiene protocol so that they can follow the rules. Also provide the necessary materials needed for this (such as gloves, guest coats and hairnets). Consider making one person within the company responsible for hygiene in the company who also have time to pay attention to this.





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# Hygiene protocol for visitors

Part of the hygiene plan is to establish a hygiene protocol for visitors. By having visitors taking certain hygiene measures, you reduce the risk of contamination. We have compiled a list of measures which form the basis of the hygiene protocol for visitors and which is in line with the official rules of [GSPG companies](#).

## Hygiene protocol

- Have visitors sign in upon entry.
- Have visitors disinfect their [hands](#) and shoes immediately upon entry.
- Provide visitors with guest coveralls, hairnets, gloves and overboots so that they can wear when entering the greenhouse.
- Ensure that visitors do not use their own materials and tools. If this is necessary, make clear arrangements and have them clean these materials/tools thoroughly before entering the greenhouse.
- Make sure that visitors stay on the main path as much as possible. Is it necessary to deviate from this? Make clear agreements about this as well.
- Let visitors disinfect their hands with disinfectant after they have touched plants.\*
- Visitors should carefully observe all points of the hygiene protocol. Inform visitors in advance
- Indicate in advance to visitors who they can contact if they have questions about the hygiene protocol.

\* Some companies provide a bottle of disinfectant so the hands can be disinfected after touching plants. If this is not the case in a company, this point of the hygiene protocol is not applicable.

## Supplement Hygiene Protocol

As mentioned, these points form the basis of the hygiene protocol for guests. Of course you can extend this list with additional points which apply specifically to your company.

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the  
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# First clean, then disinfect

After performing the disinfection scan and creating a hygiene plan, you can adjust the strategy for cleaning and disinfection strategy as necessary.

Cleaning and disinfection are not the same: cleaning removes (visible) contamination and disinfection kills the pathogens present. Good cleaning is essential for effective disinfection. Therefore make sure that the material or surface is first cleaned with a special horticultural cleanser. The amount of dirt and the type of dirt in horticulture differ considerably from other sectors. Contamination that arises by plant residues, plant juices, soil, dust and other organic material adheres very strongly to various surfaces. The degreasing properties of cleaning agents for horticulture ensure that this organic material dissolves better.

After you have removed this layer of dirt and grease, you can easily reach stubborn bacteria, fungi and germs that are below are well reached with a disinfectant. A detergent will not do this! A surface may appear clean after using a detergent, but it is not always so. Therefore: first clean, then disinfect! Also consult the [protocols for cleaning and disinfection per crop](#).

## Points of attention during cleaning and disinfection

- If you use a pesticide on a material for the first time, always do a test treatment first to check the product tolerance of the material.
- Prevent agents from coming into direct contact with plants, because some agents can cause damage to the plant.
- Make sure that you always treat a surface to be cleaned or disinfected evenly and that you let the agent act for long enough to get the best results.
- Always read the instructions and points of attention carefully before use.
- If indicated in the safety data sheet, use the necessary personal protective equipment.



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the  
video





**Crawling  
power**

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# Cleaning and disinfection with foam

For liquid agents, growers are increasingly opting for a foaming application. With liquid cleaning and disinfection methods, the effectiveness of the product always depends on the combination of application time and concentration. While a grower can still influence the concentration, this is not the case for the application time. This depends on the application technique and climate conditions. Using foam as a cleaning or disinfection method you can also influence the application time.

## Benefits of foam

In many cases it is more effective to use a foaming cleaning agent, for example when cleaning pots, boxes, seed trays, plant trays, boxes, pipe rail carts, pallets, rolling tables, transport materials, (glass) facades and floors. Foam has several advantages:

- Foam extends the application time and thus the effectiveness of treatments, because it has a much greater adhesion capacity. This adhesive power ensures that it drains off less quickly, which makes foam also suitable for cleaning or disinfecting vertical surfaces such as greenhouse walls. Especially when fighting viruses a longer penetration time is of great importance

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the  
video



- The crawling power of foam ensures that hard to reach surfaces, cracks and corners can be treated. Foam is a safer choice because fewer aerosols (mist) when using foam are formed. When using foam, it is easy to see whether the entire surface has been treated.

Note: in a recirculating box or tray washing machine a foaming cleaner not recommended.

# Let's improve together.



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## Do you have any questions about this whitepaper?

Then please contact product specialists



### **Jasper Verhoeven**

Jasper has worked at Royal Brinkman since 2017. He is a specialist in the field of hygiene & disinfection where he is involved with the concept HortiHygienz.