



ToBRFV in irrigation water

Basins and silos

Pathogens such as bacteria, fungi and viruses are transferred by birds and ducks from one basin or silo to another basin.

The germ level in basins and silos is very high.

This is because the few pathogens that are transmitted by ducks and the like are multiplied by the biofilm.

Biofilm

The biofilm is a slime layer on the walls of basins, silos and tanks. Bacteria, fungi and viruses are multiplied in the biofilm. This keeps repeating itself. Biofilm is difficult to non-degradable due to existing techniques such as chemicals and UV light.

Algae

Combating algae in the basin is not only important for the prevention of clogged filters, but also in connection with this. spread of viruses. Viruses cannot move themselves, but attach to a piece of organic material and thus hitch a ride. The less organic matter in the water, the better.

UV disinfectant

Normally, the water is passed to the greenhouse via a UV disinfectant.

The effect of a UV disinfectant increases by deposits (biofilm) on glass pipes or polluted water. As a result, a large part of the pathogens will end up in the greenhouse.

Viruses are not controlled by UV in any case by UV.

For fungi, laboratories maintain that if less than 25 CFU per ml passes through the UV disinfectant, it will work sufficiently. Let 25 million CFU (active germs) per ml equals 25 million CFU per m³. A considerable contamination of the irrigation water. This result has to be improved with USAF™

USAF™ (ultrasoundinfo.nl)

USAF™ transmitters send strong ultrasound into the water. This sound pressure forms gas bubbles between the water molecules. When these gas bubbles implode, a pressure wave of 2000 atmospheres is created. These pressure waves will damage pathogens present in the water by rupturing the pathogen's membrane. A large part of the pathogens will die. Video on YouTube shows the effects of imploding gas bubbles on aluminum foil.

<https://www.youtube.com/watch?v=xwuwO9wQ934&t=22s>

FIGHT PATHOGENS WITH USAF™

Fight against:

Bacteria

Fungi

Envelope viruses

Non-envelope viruses

TMV

ToBRFV

ToMV

Algae

High Power Ultrasound

Unique technique

Cavitation principle

Cell wall damage

Fast effect

Combination with UV

H2O2

Scientifically proven

Fight biofilm

Ten years of experience in horticulture

Minimal maintenance

Patented NL2000797

USAF™ effect on bacteria

Bacteria will be effectively controlled by USAF. See the literature study “Ultrasound as a sterilization method” of the University of Utrecht (UU), page 26. Combination with other techniques will be even more effective.

USAF™ effect on fungi

The literature study shows that fungi are damaged by a USAF™ treatment, as a result of which an additional treatment with chemistry or a UV disinfectant destroys the fungi. Extensive testing in the rinsing of flower bulbs shows that a combination of hydrogen peroxide and USAF™ completely kills fusarium during rinsing. During these tests it was established that the amount of hydrogen peroxide (H₂O₂) could be reduced by 75%. This is because no more H₂O₂ is needed to dissolve the membranes.

USAF™ effect on viruses

Viruses can be divided into envelope and non-envelope viruses.

Non-envelope viruses are the so-called Tobamo viruses, such as ToBRFV (Tomato brown rugose fruit virus), TMV (Tobacco Mosaic) and ToMV (Tomato Mosaic Virus).

The infectivity of envelope viruses will significantly diminish with USAF™ (UU) treatment.

The non-envelope virus TMV has been scientifically shown to break when treated with USAF™ (UU, page 28) ([Newton, 1951] [Oster, 1947] and [Scherba, et al 1991]).

It can be assumed that other Tobamo viruses, such as ToBRFV and ToMV are also broken by USAF™, or at least damaged, after which other techniques can do the rest. Combination treatment with, for example, H₂O₂ or UV disinfectant will improve the result.

