

# DISINFECTION OF NUTRIENT SOLUTIONS WITH HUWA-SAN TR-50 TO PREVENT THE SPREAD OF TOBACCO MOSAIC VIRUS (TMV)


**DISINFECT**

**Horticulture**

*Tobacco Mosaic Virus (TMV) continues to pose a serious threat to tomato cultivation worldwide. In this case study we wanted to identify the potential virus spread through the nutrient solution and the prevention of it through disinfection with Huwa-San TR-50. Since the virus is difficult to control once it is present, prevention is critical within a greenhouse.*

## THE CHALLENGE

Most greenhouses have irrigation systems with long pipes that allow the water to stand still for long periods of time. On top of that, an infection can build up in a closed water irrigation system. If no qualitative disinfection is applied, microorganisms are given the opportunity to multiply and form a biofilm. Biofilms on pipe walls can shelter TMV particles. Therefore, a good disinfection protocol is essential in preventing the spread of TMV through the nutrient solution.

## OUR SOLUTION

In this trial, we aimed to evaluate the efficacy of **Huwa-San TR-50** in preventing the spread of TMV and other pathogens through a nutrient solution. Two irrigation systems were compared: in the first system, the drain solution was disinfected with **Huwa-San TR-50** before recycling, while in the second, the drain solution was reused without prior disinfection. At the end of each irrigation line, the dirty drain solution was collected in buckets and subsequently transferred into two separate barrels—one for each system—where the new nutrient solution (drain and RO water) was manually prepared.

### Drain disinfection

In the disinfection unit of the system, **Huwa-San TR-50** (concentration: 200 ppm) was added to the drain solution to ensure effective disinfection. After a minimum contact time of 12 hours, the resulting clean drain solution was reused for the preparation of a new nutrient solution. Once this solution was prepared, the Huwa-San concentration was verified using test strips, both in the storage barrel and at the dripper outlets during irrigation. This procedure replicated the real operating conditions of a greenhouse facility that recycles its nutrient solution. (Fig 1)

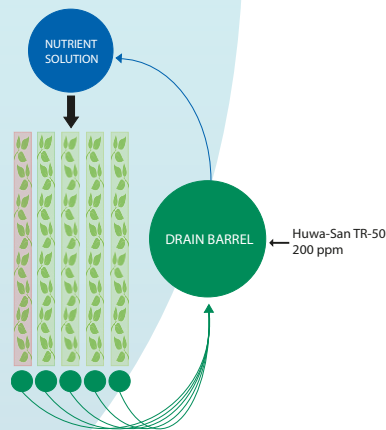


Fig. 1: Trial set-up

## THE BENEFITS

- » Long-term oxidative activity through silver stabilisation
- » Penetrates biofilms more effectively than standard peroxide
- » Effectively removes and prevents biofilm
- » Prevents the spread of harmful pathogens such as TMV

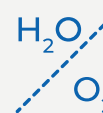
## RECOMMENDED PRODUCT



Advanced water hygiene



No rinse surface disinfection



No harmful residuals



Biofilm removal

In the system where the drain solution was not disinfected, TMV was detected, confirming that the virus can be transferred to the drain solution via the roots of infected plants. In contrast, no TMV was detected in the disinfected drain, demonstrating that **Huwa-San TR-50** is highly effective as a drain disinfection method against Tobamoviruses, including TMV. (Table 1)

Sample description	Sample type	Tobamovirus analysis RT-PCR
Disinfected drain	Water	Tobamovirus not detected
Non disinfected drain	Water	Tobamovirus detected, TMV identified

Furthermore, there was no evidence of TMV spread through the nutrient solution in the system where disinfection was applied. The limited TMV presence observed in plants irrigated with the disinfected nutrient solution can be attributed solely to mechanical transmission, such as plant-to-plant contact, resulting in a significantly lower contamination rate. These findings indicate that continuous disinfection is essential to effectively control the spread of TMV through the nutrient solution.



Fig. 2: Crop infected with TMV, non disinfected drain solution



Fig. 3: Crop free of TMV, disinfected drain solution with Huwa-San

## CONCLUSION

In addition to its antiviral effect, the presence of **Huwa-San TR-50** helps to maintain a biofilm-free irrigation system, thereby reducing the risk of establishment and spread of various plant pathogens. Conversely, in the system using a non-disinfected nutrient solution, TMV spread occurred both through mechanical transmission and via the nutrient solution itself, leading to a higher overall contamination rate.

*Huwa-San is a biocide and subject to certain laws and regulations per country. As a result, in some countries, our full range isn't available. Please contact us for more information on our registrations. Use biocides safely. Read the label carefully before usage.*

