Introduction of Filtration Systems in Container Nurseries for Nonchemical Elimination of *Phytophthora* spp. From Irrigation Water[1]

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Abstract

In a 3-year project the elimination of *Phytophthora* spp. from the recirculation water with different kinds of filtration systems will be tested under commercial conditions in container nurseries. First results indicate that the filtration systems eliminate *Phytophthora* spp. from the water.

Key words: Phytophthora spp., recycling water, filtration systems, commercial nurseries

Introduction

The production of hardy ornamental nursery stock (HNS) outdoors in containers is an important part of the German horticultural industry. The plants are cultivated outdoors in containers in special areas (container stands). On these areas the surplus water from irrigation and natural rain is collected via drains and/or special drainage systems and stored in special reservoirs. These reservoirs usually have capacities between 400 and 25,000 m^3. The reservoir water is usually taken for irrigating the container nursery, hence the possibility exist that the entire nursery can be contaminated. If there is not enough water in the reservoirs (e.g. during summer) ground water from wells is frequently used for refilling.

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Studies in commercial container nurseries have shown that *Phytophthora* spp. can be present in the drains and in the reservoirs (but not in the wells) irrespective of the season (Themann et al. 2002). A 3-year project has been started to test different filtration systems for eliminating *Phytophthora* spp. from recycling water under commercial conditions in nurseries. Preventing spread of these pathogens reduces the risk of infections and leads to environmentally sound production, due to fewer applications of chemicals. The German Federal Ministry of Consumer Protection, Food and Agriculture (BMVEL) and the Federal Agency for Agriculture and Food (BLE) funded the project.

Material and Methods

Filtration Systems – Three different filtration systems are tested: slow sand filtration, filtration with lava grain (SHIEER BIO FILTER®) and constructed wetlands with different plant species.

Samples and sampling – Water and/or sediment samples before and after filtration as well as samples from drains and clean water reservoirs were taken at three different dates over the course of the year.

Detection methods – Presence of *Phytophthora* propagules in the samples will be tested with the rhododendron leaf test, determination of the species with morphological studies and/or with Polymerase Chain Reaction (PCR). In addition the rhododendron leaf test should help to detect active and viable propagules of the pathogens.

Filtration systems data – Technical data of the different filtration systems like filtration capacity, necessity and frequency of cleaning of the filter surface (slow sand filtration) etc. will be recorded.

Water data – Chemical data of the water like nutrition, pH etc. will be analysed.

Costs – Cost for running the recirculation system under commercial conditions will be calculated.

Preliminary results

Preliminary results indicate that all three filtration methods eliminate *Phytophthora* spp. from the water under commercial conditions. Isolation and determination procedures have not yet been completed.

References

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