

Introduction of Filtration Systems in Container Nurseries for Non-Chemical Elimination of *Phytophthora* spp. from Irrigation Water

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Container nurseries often apply recirculation systems where rain and irrigation water is collected from the container area via drains and special draining systems and reused for irrigation, to economize the water consumption. For the conservation of healthy plants the use of non contaminated irrigation water is of great ecological and economical interest. Hence cleaning of water is important for prevention of the spread of pathogens by means of recirculation water. In a field experiment founded by the German Federal Ministry of Consumer Protection, Food and Agriculture (BMVEL) five different types of filtration systems were built in container nurseries in Germany to investigate the efficiency for elimination of *Phytophthora* spp. from irrigation water and to optimize the technical handling of the filters. For this purpose the effectiveness of the filtration systems is verified over a period of three years.

Water from the container area is collected in a basin, passes through the filtration system and is stored in a clean water basin until use for irrigation again. The filtration systems under investigation are different types of i) slow sand filtration, ii) Shieer-biofiltration and iii) a filtration system in expanded clay and plant roots. In three different slow sand filtration systems water percolates slowly through layers of sand and gravel whereat it is cleaned mechanically and biologically by microorganisms probably mainly on the surface of the filter. The filtration capacity of the constructed filters varies depending on the size of the system from 30 to 90 m³ per hour. The Shieer-biofilter was installed by the Dutch manufacturer Shieer Holland Int. This filtration system bases upon the activity of microorganisms which are located on the surface of lava gravel in circulating water. The filter is constructed in steel tanks. Every steel tank can filter up to 34 m³ per hour. In the third filtration system water flows slowly through two levels of root systems of suitable plants. Water sips firstly through a root system in a substrate containing expanded clay and secondly through an aquatic root system. The small system filters approximately 1.3 m³ per hour.

The triannual project started in 2003 and investigations are still in process. Aspects of the construction and function of the filtration systems will be discussed. The important technical optimization process on the special conditions of the nursery is described. Results from the first two years of operating filters give a first impression of the facilities of filtration systems in practical use.