

Transmission of viruses in soilless cultivation systems

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With references to the given studies it has been shown that plant pathogenic viruses are widely spread in environment and occur in soil and waters like ditches, rivers, streams, lakes sea water and even glacier ice. Plant viruses detected in water share certain features as they are stable, except a few samples like *Cucumber mosaic virus* (CMV) and *Tomato spotted wilt virus* (TSWV), process wide host ranges, and occur in high concentration in plant tissue. All of them can infect plants through their roots. It has been demonstrated for a number of viruses that they can be released from undisturbed roots, but obviously microwounded cells into the soil and water. Infected plants growing in the vicinity of waters may thus likewise be a source of plant viruses in rivers and lakes. Dump material from vegetables and ornamentals as well as composts have to be considered as sources of viruses in surface waters. Plants will be repeatedly inoculated with viruses contaminating the water independent whether the initial source of water harbours viruses or viruses enter the water along the path of distribution. Hence the use of hydroponic systems with recirculating nutrient solutions may facilitate virus transmission. Experiments on the transmission of many different viruses demonstrate the infection of plants through roots in recirculating irrigation systems within 1 to 3 months. Therefore the risk of dissemination of plant virus diseases often resulting in crop losses has to be evaluated before the assignment of recirculating respectively reused water.