

UV Disinfection Tunnel Post harvest Test, Results and Observations

**1. Introduction**

*Botrytis cinerea* Pers. is a ubiquitous fungal pathogen that causes gray mold in many fruit, vegetable and ornamental crops (Schwinn, 1992). Rose, gerbera and chrysanthemum are among affected cut flower species (Elad, 1988). Infection by *Botrytis cinerea* reduces the postharvest quality of rose flowers leading to substantial economic loss by growers and wholesalers (Vrind, 2005). The infection process in rose begins with deposition of conidia on petals during flower development (Keressies et al., 1995). Disease symptoms are usually first visualized on petals after harvest as small quiescent lesions or pocks (Pie and De Leeuw, 1991). When exposed to humid (>93% relative humidity; RH) conditions, such as during transport and storage, lesions become necrotic and can spread to infect entire petals (Salinas et al., 1989; Williamson et al., 1995).

**Evolution of Botrytis contamination on flowers**



Synthetic chemical fungicides (e.g. benzimidazoles, dicarboximides) have long been relied on to reduce *Botrytis cinerea* disease development (Elad and Shtienberg, 1995). However, continued use of these fungicides is problematical owing to development of fungal resistance and increasing social and environmental concerns over chemical residues (Williamson et al., 2007).

The UVDT system, an eco-friendly and more efficient alternative strategy for reducing *Botrytis cinerea* infection on rose flowers, has been tested in Subati Flower Farm in Kenya.

The UV principle is a reliable and environmentally friendly disinfection method. UV radiation destroys genetic structure of micro-organisms (fungus, virus, bacteria, cysts) thus causes their death without chemical addition.

In the present study, we highlight and prove that postharvest treatment of rose flowers with UVDT system reduces the development of *Botrytis cinerea* on petals. The aim of the test is also to determine the optimal UV treatment time and distance/ exposure to the treatment, without any petal tips discoloration or burning developing through vase life. The activity of UVDT system relative to conventional fungicides and its efficacy to treat and reduce disease on rose flowers subjected to commercial shipment were also evaluated.

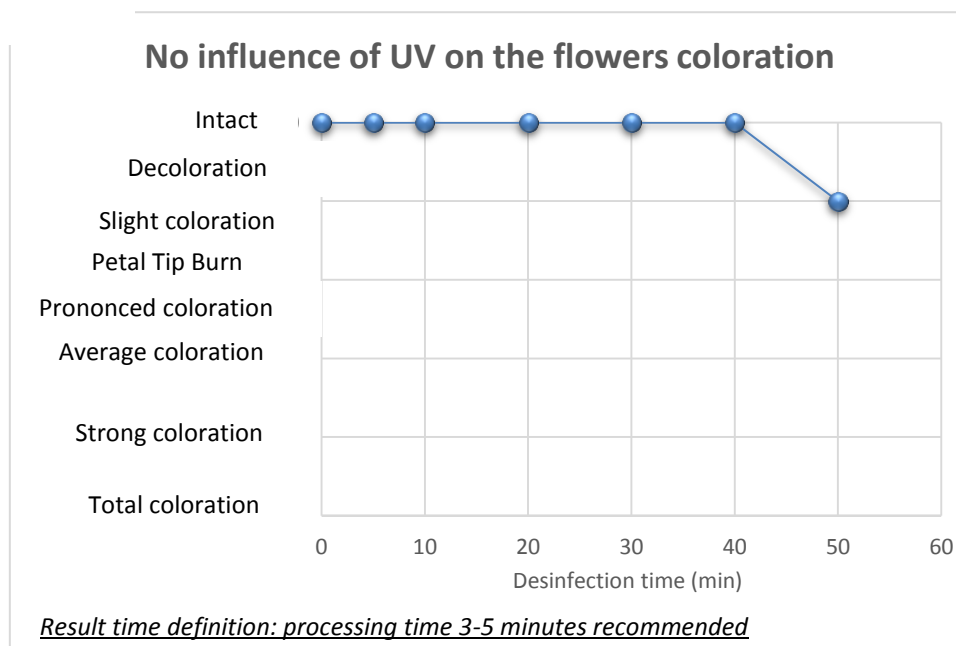
## 2. Materials and methods

The UVDT system has been tested on different varieties of roses and compared to one's without treatment. Rose flowers were harvested at commercial maturity (i.e. outer petals starting to reflex) from Subati Farm in Kenya. Cultivars with a known high susceptibility to natural infection with *Botrytis cinerea* were selected based on observations by commercial growers.

The vase test observations were systematically done with treated UVDT sample compared to untreated sample.

The optimal duration of the UVDT treatment was determined by testing on the following varieties « Yovanka », « Panny Lanne », « A One », « Anyya », « Atomic », « Bellerose », « Solinero », « Palmador », « Ace Pink », « Barbados », « Abeba », « Carosel ».

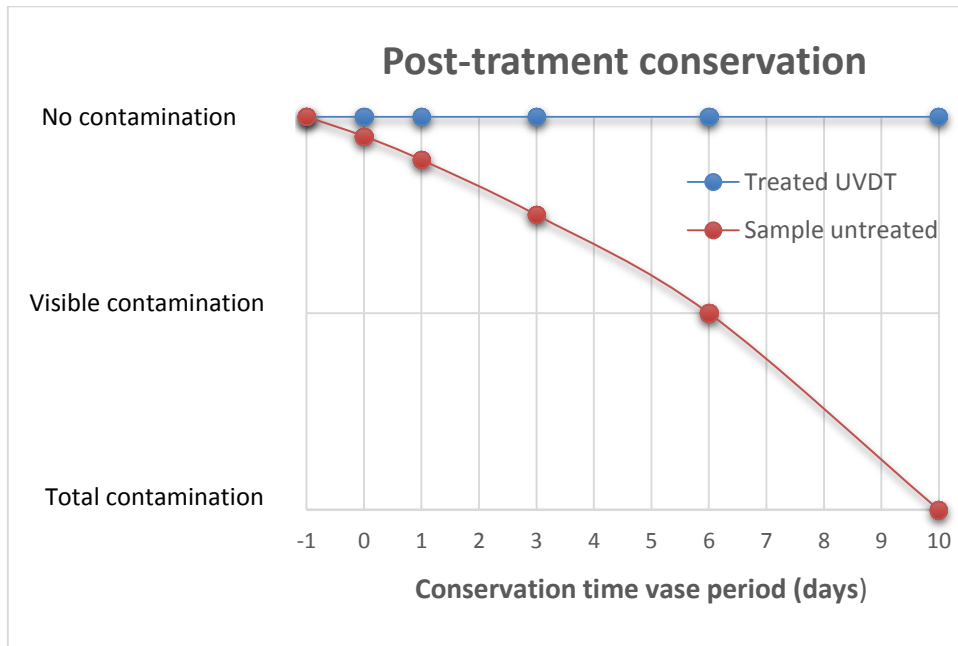
## 3. Influence of UV on the flowers coloration



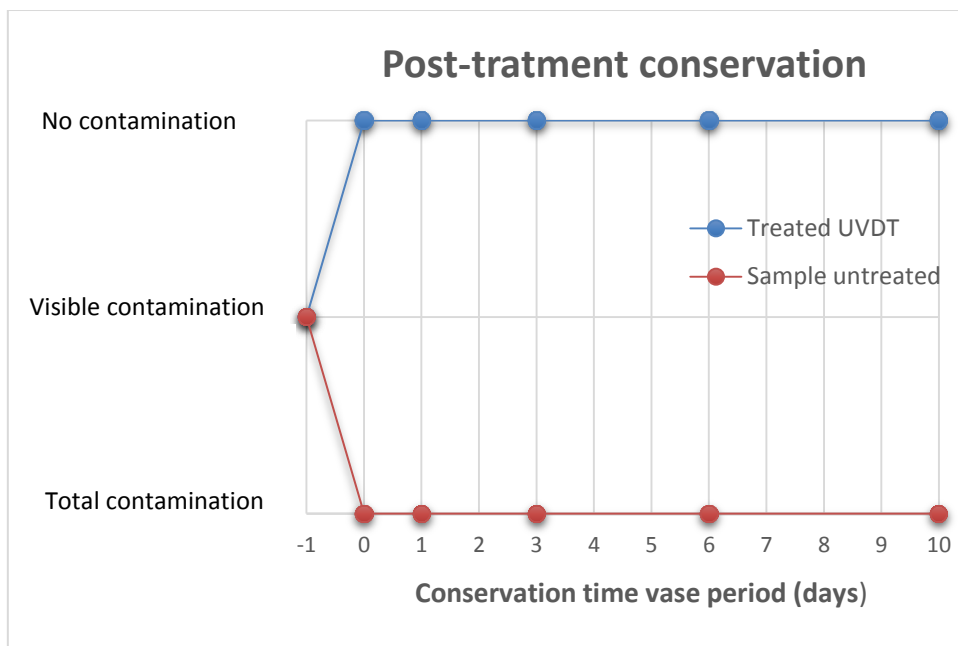
The tests have shown no negative effects on the flowers. It doesn't create any petal tips burning or discoloration up to 45 min of exposure, showing a light tip burning on one variety petal

Therefore the UVDT has no negative effect on the shape and cut stage on flowers

**4. Test of UVDT post-harvest treatment effect on vase conservation on different varieties of non-contaminated flowers**



**5. Test of UVDT post-harvest treatment effect on vase conservation on different varieties of contaminated flowers**





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## **6. Results:**

**Immediate effect:** UVDT has a significant impact on curing petal Botrytis symptoms and prevents Botrytis development on flowers before packing and development of new infections during Vase Life

**Long term effect:** The UVDT limits production losses and the use of chemical products. The UVDT improves the shelf life of the flowers