



Preharvest hormetic doses of UV-C radiation can decrease susceptibility of lettuce to Botrytis

Hilariòn Vàsquez, Jawad Aarouf, Laurent Urban, Yves Lizzi, Marine Forges, Chayma Ouhibi, Nassera Azzouz, Marc Bardin, Philippe C. Nicot

► To cite this version:

Hilariòn Vàsquez, Jawad Aarouf, Laurent Urban, Yves Lizzi, Marine Forges, et al.. Preharvest hormetic doses of UV-C radiation can decrease susceptibility of lettuce to Botrytis. 10. Conférence de la Société française de phytopathologie. 12. European foundation for plant pathology conference, May 2017, Malo-les-Bains, France. , 2017, Deepen knowledge in plant pathology for innovative agro-ecology. hal-02735122

HAL Id: hal-02735122

<https://hal.inrae.fr/hal-02735122>

Submitted on 2 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Preharvest hormetic doses of UV-C radiation can decrease susceptibility of lettuce to *Botrytis*

Hilarion Vàsquez¹, Jawad Aarrouf¹, Laurent Urban¹, Yves Lizzi¹, Marine Forges^{1,3}, Chayma Ouhibi^{1,2}, Nasser Azzouz¹, Marc Bardin³ and Philippe Nicot³

¹Laboratoire Physiologie des Fruits et Légumes (UMR Qualisud), Université d'Avignon et des Pays du Vaucluse, 301 Rue Baruch de Spinoza, 84916 Avignon

²Unité de Physiologie et Biochimie de la Réponse des Plantes aux Contraintes Abiotiques, Département de Biologie, FST, Université Tunis El Manar, 1068 Tunis, Tunisie

³Plant Pathology, INRA, F-84140, Montfavet, France

Post harvest applications of UV-C radiation have proven very efficient in reducing the development of post-harvest diseases in many species including lettuce (*Lactuca sativa* L.). Several studies suggest that UV-C radiation is effective not only because of its disinfecting effect but also because it may stimulate plant defences. Preharvest treatment with UV-C radiation may thus offer an interesting potential for lettuce protection, provided that application doses are effective while excluding any harmful effects on the plants. Here we provide evidence that 0.85 kJ.m⁻² and 1.70 kJ.m⁻² represent doses of UV-C radiation that are not deleterious for lettuce plants. We used several criteria to evaluate the effect of UV-C radiation on the plant, including histological observations; the concentration of malondialdehyde, an indicator of membrane integrity, as well as parameters derived from measurements of chlorophyll fluorescence, such as maximal efficiency of photosystem II (Fv/Fm) and the Performance Index (PI) of Strasser. We observed that a single dose of 0.85 kJ.m⁻² slightly increased plant resistance to grey mould (*Botrytis cinerea* L.) while a single dose of 1.70 kJ.m⁻² had the opposite effect. When a 0.85 kJ.m⁻² dose was applied 4 times, at two-day intervals, there was an increase in the total phenol content of leaves, and in phenylalanine ammonia lyase, catalase, and MDAHR activities. Leaves inoculated 2 days after the last UV-C treatment showed significantly increased resistance (-30%) when compared to the control.

Keywords: UV-C, *Botrytis*, fluorescence, resistance, PAL, *Lactuca*