

Title UV-B and gamma irradiation as physical elicitors to promote phytochemicals in brassica sprouts

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Abstract

In numerous epidemiological studies inverse associations between the intake of brassicaceous crops and chronic diseases, such as cancer and cardiovascular diseases, have been demonstrated. Phytochemicals such as carotenoids or phenolic compounds have been indicated to be responsible for this protective health effect. It is known that distinct changes in the content of certain phytochemicals can be triggered by the application of physical elicitors, e.g., UV and gamma irradiation, during production and postharvest operations. In order to determine the effect of short-term UV-B exposure and gamma irradiation as targeted stress treatments on the secondary plant metabolism, sprouts were subjected to three UV-B radiation intensities: 0.075, 0.10 and 0.15 Wh m⁻². Gamma irradiation was performed in dosages of 0.5, 1.0, 3.0, and 6.0 kGy. The results clearly demonstrate that the plant response to short-term and moderate UV-B exposure as well as gamma irradiation is dependent on the physiological plant stage and on the phytochemical compound.