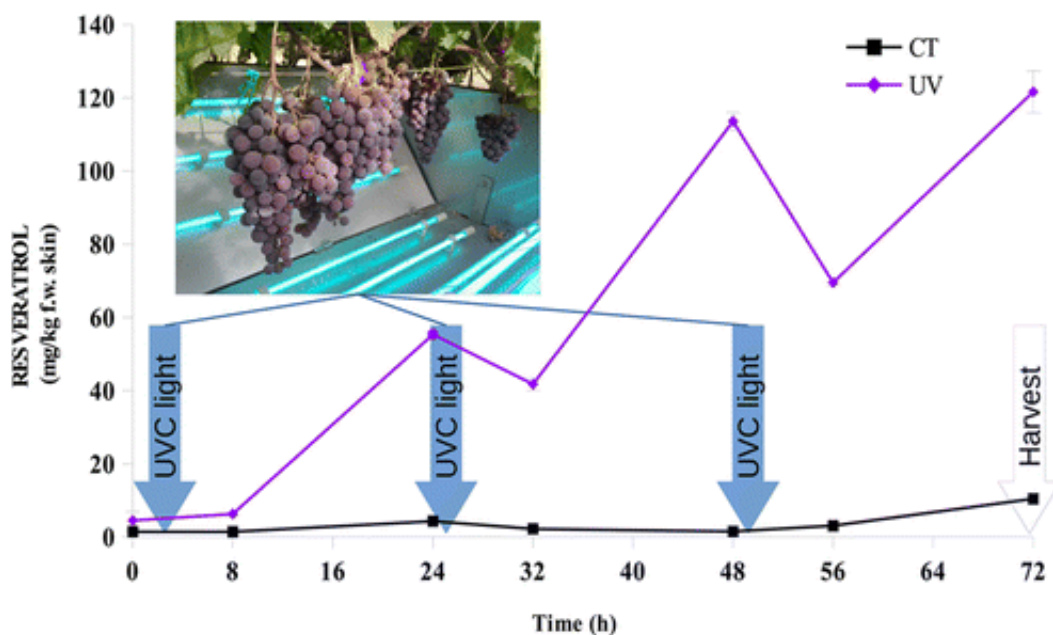


Protecting grapes from pests by boosting their natural immunity

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From protecting our most valuable works of art to enabling smartphone displays, glass has become one of our most important materials. Making it even more versatile is the next challenge. Developing new glass compositions is largely a time-consuming, trial-and-error exercise. But now scientists have developed a way to decode the glass "genome" and design different compositions of the material without making and melting every possibility. Their report appears in ACS' journal *Chemistry of Materials*.

As is true for any agricultural producer, vineyard owners need to prevent pathogens from harming their crops to stay in business. For many of them, this means applying [synthetic pesticides](#). Out of concern for these substances' potential effects on water, soil and human health, some winemakers have turned to more natural methods. One approach scientists are exploring involves the use of UV-C light, which studies have shown increases grapes' production of stilbenoids. Some of these phenolic compounds have been associated with natural disease resistance. Raúl F. Guerrero from the Andalusian Institute of Agricultural and Fisheries Research and Training (IFAPA) and colleagues wanted to explore how daily doses of pre-harvest UV-C light would affect grapes' stilbenoid content.

The researchers tested one set of grapes exposed to five minutes of UV-C light every day for three days before harvesting and compared them with another set of grapes that only received one five-minute dose. The latter technique had previously been optimized in grapes. The set that received multiple treatments showed an 86-fold increase in stilbenoid concentrations over the fruit that only got one application of UV-C. The three-day, pre-harvest treatment also affected texture, color and other characteristics, but the researchers say that the grapes were still of good quality.

More information: Raúl F. Guerrero et al. Daily Preharvest UV-C Light Maintains the High Stilbenoid Concentration in Grapes, *Journal of Agricultural and Food Chemistry* (2016). [DOI: 10.1021/acs.jafc.6b01276](https://doi.org/10.1021/acs.jafc.6b01276)

Abstract

The fact that it is possible to induce stilbenoid synthesis in grapevine (*Vitis vinifera*) by UV-C light allows the possibility of stimulating grapevine phytoalexin production to increase disease resistance and immunity, and subsequently to limit the use of pesticides in vineyards.

UV-C light was applied daily during three days before the harvesting of table grape variety Crimson seedless to study the accumulation of stilbenoid compounds during ripeness. The E-resveratrol concentration was monitored during daily preharvest UV-C light application and compared with that after a single application. Daily periodic preharvest UV-C light treatment showed a cumulative effect on grape stilbenoids. An 86-fold stilbenoid level increase (sum of E-resveratrol, E-piceatannol, ϵ -viniferin, E-piceid, isorhapontigenin, ω -viniferin, and Z-piceid) in grapes was achieved. The effects of UV-C light on stilbenoid in grape cane was also addressed for the first time. Stilbenoid oligomers such as hopeaphenol, ampelopsin A, and r-viniferin were quantified in cane samples. Quality grape parameters indicated an acceleration of ripening in UV-C samples.

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