

Title Effect of preharvest UV-C treatment of tomatoes (*Solanum lycopersicon* Mill.) on ripening and pathogen resistance

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Abstract

Treatment with UV-C of tomato fruit on the vine was conducted using a mobile unit that was designed to be conveyed between the rows of tomato plants in a commercial glasshouse. Trusses of fruit both at the ripe and mature green phase were treated with UV-C doses of 3 and 8 kJ/m². Ripe fruit were picked 8 h after treatment and kept at room temperature for up to 16 d during which colour development and texture were monitored and compared to untreated controls. Mature green fruit treated on the vine with UV-C doses of 3 or 8 kJ/m² showed only a slight loss in green pigmentation in contrast to the tomato colour index (TCI) of control fruit which increased sharply 5 d after treatment. The TCI of ripe fruit treated with UV-C at a dose of 8 kJ/m² showed a lag of 10 d before increasing to a final value comparable to that of untreated fruit. Fruit treated with a dose of 3 kJ/m² did not display a lag but the increase in TCI occurred at a lower rate than for the controls. Firmness remained higher in fruit treated with the highest UV-C dose compared to fruit treated with the lower UV-C dose and controls. Fruit covered with UV impermeable film on the same plants as those that had received a UV-C dose of 3 kJ/m² had become ripe by day 6 in a manner similar to that of the controls. By contrast, fruit from trusses adjacent to those that had been treated with a UV-C dose of 8 kJ/m² remained green over the same period of time. Ripe fruit treated as described above were inoculated with spores of *Penicillium digitatum* after UV-C treatment and their firmness monitored over 12 d. A dose response effect was found with fruit treated at the highest dose remaining firmer than those treated at the lower dose and the controls.