

Title Influence of preharvest application of fungicides on the postharvest quality of tomato (*Solanum lycopersicum* L.)

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Abstract

Chemical fungicides are widely used for the control of preharvest fungal diseases. However, they may induce changes in quality characteristics, accelerating or delaying senescence. The effects of preharvest application of fenhexamid, or pyraclostrobin + boscalid, on tomato fruit (*Solanum lycopersicum* L.) cvs. Raf, Amadeo and Nereida, were compared to untreated fruit at harvest and during storage. The impact of fungicides in Nereida tomatoes was notable as fruit treated with fenhexamid displayed increased in maturity index, weight loss and the accumulation of vitamin C compared with fruit treated with pyraclostrobin + boscalid. Preharvest application of pyraclostrobin + boscalid delayed ripening and senescence of long life Nereida tomatoes and therefore affected postharvest quality. Application of pyraclostrobin + boscalid to Nereida tomatoes reduced weight loss, did not modify fruit color, sugar content or acidity, and did not induce the accumulation of lycopene and phenolic compounds. The same preharvest treatments did not affect the main quality attributes in Raf and Amadeo cultivars, short and short-medium life tomatoes, respectively. Untreated fruit had higher contents of total and individual phenolic compounds such as naringenin and naringenin chalcone as they may act as plant defence secondary metabolites. Preharvest application of pyraclostrobin + boscalid, as well as having a broad-spectrum activity for fruit disease control, may also be beneficial in prolonging the postharvest life of long life cultivars such as Nereida tomatoes without negatively affecting quality attributes. The results of this study suggest that different fungicides may have different potential for the preservation of tomato quality, but the responses depend on the cultivar.