

Preharvest use of biodegradable polyester nets added with cinnamon essential oil and the effect on the storage life of tomatoes and the development of *Alternaria alternata*

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Abstract

Nets in agriculture are used during crop development to provide shade and protection against the pest attack, while fruit packaging during storage is used to extend and maintain the quality of horticultural products. This study has evaluated the *in vitro* antifungal activity of biodegradable nets and their effect on the shelf life and control of *A. alternata* in tomatoes. The biodegradability of the nets was also determined. The nets were made from extruded fibres of two biodegradable polymers, poly (lactic acid) (PLA) and poly (butylene adipate-co-terephthalate) (PBAT) and cinnamon bark essential oil (CEO). The fiber with 6.1% of CEO inhibited the *in vitro* mycelial growth of *A. alternata* in 72.7% and germination in 100%. The use of nets during the development of tomatoes in the plant had no effect on weight loss, firmness, TSS; titratable acidity and carotenoid content during storage, but values of the antioxidant capacity and ethylene were notably higher in those tomatoes grown in nets with CEO. The incidence of *A. alternata* in tomatoes was slightly higher in non-treated fruit compared with those grown only with nets and nets with CEO. The biodegradation of nets at 24 weeks was higher in those made with PLA followed by those with CEO. Our results lead us to continue to consider this technology for further pre- and postharvest issues.