

Title Effect of polyethylene thickness, photoperiod and initial stage at harvest on ripening of two tomato (*Lycopersicon esculentum* mill.) Cultivars

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Abstract

The effects of thickness of polyethylene (PE) packaging material, photoperiod and at-harvest stage of ripening on further ripening during storage at 28°C of fruit of the tomato cultivars 'Roma' and 'Beske' were studied. Fruit at the first four stages of ripening - mature-green, breaker, turning and pink - were separately packed in PE of 2.5, 5.0, 10 and 20 µm thickness, sealed and stored either under 12h naturally-alternating light and dark (LD) or complete darkness (D). Daily observation for progressive red colour development showed that photoperiod, packaging material and initial stage of ripening before packing and storage affected ripening. The ripening of mature-green fruit of 'Beske' tomatoes was independent of photoperiod, but decreased with thickness of PE packaging material. Ripening progressed in D more than in LD in breaker fruit. However, the difference was more pronounced in 'Roma' than in 'Beske' tomatoes. The least ripening in 'Roma' fruit was observed in 20 µm thick PE in LD while the greatest colour development was observed in 2.5 µm thick PE also initially at the breaker stage. There was no significant difference between effects of 10 µm and 20 µm thick PE material on 'Beske' fruit except at turning in both photoperiods and green in D. Fruit initially at turning did not show any significant effect of photoperiod in 'Roma' but did by day 6 in the local cultivar. Further ripening of pink fruit was unaffected by thickness of PE in 'Roma' fruit stored in D but had significant effect in LD. The same trend was observed in 'Beske' fruit. Generally, both photoperiod and thickness of packaging material had more significant effect at the early stages (mature-green and breaker) than at the turning and pink stages of ripening. There were significant interactions of all the factors in 'Roma' fruit but not in all the combinations in 'Beske' fruit.