

Ripening and quality responses of avocado, custard apple, mango and papaya fruit to 1-methylcyclopropene

[P. J. Hofman](#), M. Jobin-Decor, G. F. Meiburg, A. J. Macnish and D. C. Joyce

Abstract

The potential for the ethylene binding inhibitor, 1-methylcyclopropene, to delay ripening of 'Hass' avocado, 'African Pride' custard apple, 'Kensington Pride' mango and 'Solo' papaya was examined. Fruit were gassed with 25 $\mu\text{L/L}$ 1-methylcyclopropene for 14 h at 20°C, followed by treatment with 100 $\mu\text{L/L}$ ethylene for 24 h, and then ripened at 20°C. Ethylene treatment alone generally halved the number of days for fruit to reach the ripe stage, compared with untreated fruit. 1-Methylcyclopropene treatment alone increased the number of days to ripening by 4.4 days (40% increase), 3.4 days (58%), 5.1 days (37%) and 15.6 days (325%) for avocado, custard apple, mango and papaya, respectively, compared with untreated fruit. Applying 1-methylcyclopropene to the fruit before ethylene prevented the accelerated ripening normally associated with ethylene treatment, so that the number of days to ripening for fruit treated with 1-methylcyclopropene plus ethylene was similar to the number of days to ripening for fruit treated with 1-methylcyclopropene alone. 1-Methylcyclopropene treatment was associated with slightly higher severity of external blemishes in papaya and custard apple, slightly higher rots severity in avocado, custard apple and papaya, and at least double the severity of stem rots in mango, relative to fruit not treated with 1-methylcyclopropene. Thus, 1-methylcyclopropene treatment has the potential to reduce the risk of premature ripening of avocado, custard apple, mango and papaya fruit due to accidental exposure to ethylene. However, additional precautions may be necessary to reduce disease severity associated with 1-methylcyclopropene treatment.

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