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Effect of Aminoethoxyvinylglycine on Ceasing in Sweet Orange

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Abstract : Creasing is a physiological disorder of rind in sweet orange [Citrus sinensis (L.) Osbeck] fruit and causes serious economic losses in various countries of the world. The reversible inhibitor of ethylene, aminoethoxyvinylglycine (AVG) with the effects of different concentrations (0, 20, 40 and 60 mgL^{-1}) AVG with 0.05% 'Tween 20' as a surfactant applied at the fruit set, the golf ball or at the colour break stage on controlling creasing, rheological properties of fruit and rind as well as fruit quality in of Washington Navel and Lane Late sweet orange was investigated. Creasing was substantially reduced and fruit quality was improved with the exogenous application of AVG depending upon its concentration and stage of application in both cultivars. The spray application of AVG (60 mgL^{-1}) at the golf ball stage was effective in reducing creasing (27.86% and 24.29%) compared to the control (52.14 and 51.53%) in cv. Washington Navel during 2011 and 2012, respectively. Whilst, in cv. Lane Late lowest creasing was observed When AVG was applied at fruit set stage (22.86%) compared to the control (51.43%) during 2012. In cv. Washington Navel, AVG treatment (60 mgL^{-1}) was more effective to increase the fruit firmness (318.97 N) and rind hardness (25.94 N) when applied at fruit set stage. However, rind tensile strength was higher, when AVG was applied at the golf ball stage (54.13 N). In cv. Lane Late, the rind harness (28.61 N), rind tensile strength (78.82 N) was also higher when AVG was sprayed at fruit set stage. Whilst, the fruit compression force (369.68 N) was higher when AVG was applied at the golf ball stage. Similarly, the treatment AVG (60 mgL^{-1}) was more effective in improving fruit weight (281.00 and 298.50 g) and fruit diameter (87.30 and 82.69 mm), rind thickness (5.56 and 5.38 mm) and total sugars (15.27 $mg.100ml^{-1}$) when AVG was applied at the fruit golf ball stage in cv. Washington Navel and Lane Late, respectively. Similarly, rind harness (25.94 and 28.61 N), total antioxidants (45.30 and 46.48 mM trolox $100ml^{-1}$), total sugars (13.64 and 15.27 $mg.100ml^{-1}$), citric acid (1.66 and 1.32 $mg100ml^{-1}$), malic acid (0.36 and 0.63 $mg.100ml^{-1}$) and succinic acid (0.35 and 0.38 $mg100ml^{-1}$) were also higher, when AVG was applied at the fruit set stage in both cultivars. In conclusion, the exogenous applications of AVG substantially reduces the creasing incidence, improves rheological properties of fruit and rind as well as fruit quality in Washington Navel and Lane Late sweet orange fruit.

Keywords : AVG, creasing, ethylene inhibitor, sweet orange
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