

Title Foliar application of aminoethoxyvinylglycine (AVG) delays fruit ripening and reduces pre-harvest fruit drop and ethylene production of bagged “Kogetsu” apples

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Abstract

Covering apple fruits with double layer waterproof bags to enhance fruit quality and evenness of blush colour is typical on many cultivars in Korea and Japan. Aminoethoxyvinylglycine (AVG) applied to unbagged apple fruits at 3–4 weeks before commercial harvest reduces ethylene production in the fruit, delays fruit ripening and reduces pre-harvest fruit drop. Spray application of AVG to trees of bagged apples should have no effect on apple ripening as there is no direct contact with the fruit and the translocation of AVG in apple trees is regarded as negligible. However, preliminary experiments suggested that AVG applied to trees of bagged apples reduced pre-harvest fruit drop in “Kogetsu” apples. This study investigated the effect of spray treatments of 125 ppm of AVG on fruit drop, fruit ripening (firmness, starch conversion and soluble solids) and ethylene production to whole trees with bagged or unbagged “Kogetsu” fruit, as well as sprays of only the bagged or unbagged fruit on trees on two orchards. AVG applied to whole trees with unbagged apples reduced fruit drop from an average of 58.9% to 10.4%, delayed starch conversion and decreased ethylene production. AVG applied to whole trees with bagged fruit was equally effective in reducing pre-harvest drop, delaying fruit ripening and reducing ethylene production. Application of AVG to unbagged fruit only was nearly as effective as application to whole trees with unbagged fruit but application to bagged fruit only had no effect on fruit ripening or ethylene production. Application of AVG to bagged fruit only did reduce fruit drop to an average of 42.5% but this was not as effective as spraying unbagged fruit only or whole trees with bagged fruit. Possible mechanisms for this effect are discussed.