Title Use of a solid mixture containing diethylenetriamine/nitric oxide (DETANO) to liberate nitric oxide gas in the presence of horticultural produce to extend postharvest life

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Abstract

Postharvest treatment of fruit and vegetables with a low concentration of nitric oxide gas can extend postharvest life but application of nitric oxide by release from a gas cylinder is not feasible for many horticultural situations. This paper reports on development of a solid mixture to generate nitric oxide gas in the presence of horticultural produce. The solid NO-donor compound, diethylenetriamine/nitric oxide (DETANO) was found to quantitatively liberate nitric oxide in the presence of a range of acidic substances including citric acid. A solid mixture of DETANO and citric acid with wheat starch added as a filler and moisture absorbent in the ratio of 1:10:20 was found to be stable for at least six months when stored in dry air. However, in humid air, absorption of moisture from the atmosphere led to reaction of DETANO with citric acid and the evolution of nitric oxide gas. When the dry mixture was placed in a container with strawberry and mushroom, the moisture given off by produce activated the mixture and resulted in a similar extension in postharvest life as achieved by direct fumigation with nitric oxide gas. Commercial use of such a solid mixture could be through tablets or sachets which are more manageable in a farm or packing house than gas fumigation.