NITRIC OXIDE FUMIGATION FOR CONTROL OF QUARANTINE PESTS ON IMPORTED FRESH COMMODITIES

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Some fresh commodities such as avocados, mangos, etc. do not tolerate methyl bromide fumigation well; physical mitigation measures such as hot or cold treatments may also affect the quality of these subtropical fruits. Nitric oxide as a potential alternative to methyl bromide fumigation will have minimal or no impact on the quality of treated fresh commodities as long as the oxygen concentrations in the fumigation chambers remain at required ultralow levels (< 100 ppm). To some fresh fruit and vegetables, nitric oxide fumigation will even improve post-treatment quality and extend their shelf lives.

This study investigated the impact of nitric oxide fumigation on the quality of several fresh commodities and the efficacy on a flat mite *Brevipalpus* yothersi. With 1% (v:v) nitric oxide fumigated for 6 hours at 5 °C chamber temperature and the fumigations terminated with nitrogen flush to reduce remaining nitric oxide in the chambers at the end of fumigation, there was no adverse impact was found to the following fruit and vegetable tested: asparagus, avocado, grape, mango, navel orange, and kiwi. However, the above same fumigation conditions completely killed the adults mites of *B. yothersi.* In fact, shorter fumigation period (4 hours) and lower nitric oxide rate (0.5% v:v) also achieved 100% kill of the mite.

This presentation also compares the advantages and disadvantages of nitric oxide fumigation with other available alternative fumigants. Utilizing Control Atmosphere storages available in some large packing houses, with minimal modifications, to conduct nitric oxide fumigation at an ultralow oxygen environment is also discussed.