

## FROST DAMAGE TO AVOCADO REDUCED BY ELIMINATION OF BACTERIAL ICE NUCLEI

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Frost injury to vegetative buds of Zutano avocado were reduced significantly when treated 12 days in advance of the first subfreezing temperatures occurring on December 6-10, 1978 (minimum air temperatures 5.3 C (22.5 F)) with bactericides (Kocide 101, Kasugamycin, or a combination of streptomycin and Terramycin) or 8 hours in advance with bacterial ice nucleation inhibitors (Cationic and Quaternary ammonium surfactants, buffered solutions of pH 2.5 and 11.5 and urea solutions).

Necrosis indicative of frost injury was found in over 46.3% of the buds of unsprayed control trees while injury to treated trees ranged from less than 3.4% of buds injured to a maximum of 12.9% of buds injured.

Reductions of frost injury were correlated with reductions in the number of bacteria active in ice nucleation (both *Pseudomonas syringae* and *Erwinia herbicola*) on bactericide treated trees and in the concentration of ice nuclei active at temperatures above -9 C on leaves of trees sprayed with bactericides or bacterial ice nucleation inhibitors. The supercooling ability of avocado was therefore enhanced by reducing the concentration of ice nuclei contributed by bacteria on leaves of avocado and suggests the efficacy of this new method of frost control in avocado.