

**Title** Controlling humidity improves efficacy of modified atmosphere packaging of fruits and vegetables

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### **Abstract**

In a joint venture between Agricultural Research Organization, Volcani Center and StePac L.A Ltd. (Tefen, Israel), a series of plastic films have been developed (commercial name Xtend®) with higher permeability to water vapor than most commercially available MAP products. Using hydrophilic Xtend® films manufactured from various proprietary blends of polyamides with other polymeric and non-polymeric compounds allowed achieving in-pack relative humidity that prevented accumulation of condensed water on the produce. A beneficial modified atmosphere was achieved in the package by microperforation of the film. Film composition and the extent of microperforation were tailored in accordance with the respiratory activity and weight of the packaged produce, anticipated temperature fluctuations during storage and shipment, and expected physiological and pathological responses of the produce to CO<sub>2</sub>/O<sub>2</sub> concentrations and humidity levels inside the package. The effectiveness of Xtend® films in maintaining quality of MA-packed fresh produce was greater than that of other commercially available films such as polyethylene, polypropylene, and polyvinyl chloride. The microperforated Xtend® packaging resulted in the formation of desirable modified atmospheres that retarded ripening and senescence of the produce. Additional beneficial effects of Xtend® films included reduction of decay and chilling injury, prevention of leaf elongation leaf sprouting, tissue discoloration, peel blemishes, off-odors, and inhibition of bacterial growth on the produce surface. Description of the above mentioned effects are presented for a number of different commodities.