

**Title** Effect of the nutrient solution and shelf-life conditions on the essential oil profile of minimally processed Dill (*Anethum graveolens* L.) grown in a Soilless culture system

**Author** Emanuela Fontana, Giorgio Tibaldi, Erdinç Göksu and Silvana Nicola

**Citation** Abstracts Book, 6<sup>th</sup> International Postharvest symposium, 8-12 April 2009, Antalya, Turkey. 256 pages.

**Keyword** Vegetable; permeability; packaging

### Abstract

In recent years, the growing market demand in fresh-cut conveniences expanded its interest for minor leafy vegetables with quality properties such as taste and nutraceutical value. Dill is commonly used out of season as dried leaves or spicy seeds in North Europe, while it could be exploited as baby leaf convenience if cultivated in soilless systems, enlarging its availability on the market all year around. Investigations were conducted to study the effects of nitrogen levels (4; 8; 16 mM) and  $\text{NO}_3\text{-N}/\text{NH}_4\text{-N}$  ratios (20:80; 40:60; 60:40) in the nutrient solution during plant growth, two films with different oxygen permeability (1,990 and 1,330  $\text{cm}^3 \text{m}^{-2} \text{d}^{-1}$ ) and storage temperature (4; 12°C) during shelf-life on the essential oil profile of minimal; processed dill with a 7-day shelf-life. Two experiments were performed on November 2006. Dill was grown in 60-cell styrofoam trays using a floating irrigation system in greenhouse. At harvest, dill was packaged in trays wrapped with polypropylene films. Essential oil profile was analyzed at harvest and at the end of the shelf-life. Fresh weight loss was daily measured during shelf-life. At harvest, the essential oil profile was not influenced by both N levels and  $\text{NO}_3\text{-N}/\text{NH}_4\text{-N}$  ratios tested. After 7 days of shelf-life, fresh weight loss was greater at 12°C than at 4°C (1<sup>st</sup> exp. 1.3% vs. 0.3%; 2<sup>nd</sup> exp. 1.7% vs. 0.8%); few compounds as limonene, anethole, carvon were not detected; myristicin decreased mainly using film with high oxygen permeability. In the 1<sup>st</sup> exp. a-phellandrene did not change and b-phellandrene increased fivefold the initial value at 12°C, while in the 2<sup>nd</sup> exp. a-phellandrene decreased by 66% using film with high oxygen permeability; b-phellandrene decreased by 25% regardless of the treatments. Using the soilless culture system, dill was harvested at a younger stage than in commercial fields, limiting its effect on the essential oil profile that reaches its optimal quality and concentration peak later in the growth stage. The essential oil profile was instead affected by the postharvest conditions.