

Title            Addition of hydrogen peroxide and calcium chloride to irrigation water as a strategy to reduce bacterial populations on fresh mushrooms

Author         N. Chikthimmah, L.F. LaBorde and R.B. Beelman

Citation        Book of Abstracts, 2004 IFT (Institute of Food Technologists) Annual Meeting and Food Expo, 13-16 July 2004, Las Vegas, Nevada, USA. 321 pages.

Keyword        mushroom; hydrogen peroxide; calcium chloride

### **Abstract**

The quality and value of mushroom crops are often diminished by the presence of high bacterial populations that cause a brown, blotchy appearance that is highly undesirable to consumers. The objective of the present research was to evaluate the addition of hydrogen peroxide and/or calcium chloride to irrigation water as a means to reduce total bacterial populations on fresh mushrooms. The effect of the irrigation treatments on crop yields and quality was also assessed. Crops were grown using standard growing practices except for the addition of 0.5% hydrogen peroxide and/or 0.3% calcium chloride to the irrigation water during the duration of the crop. Irrigation water without the added treatments acted as the control. Mushrooms were aseptically sampled from the production beds for bacterial counts prior to general harvest. Total aerobic bacteria were determined by standard plating procedures. Following general harvest, mushroom whiteness (L-value) and color ( $\Delta E$ ) following 0, 3 and 6 d of storage (at 12 °C) were measured using a Minolta Chromameter. Harvested mushrooms were separated by treatment and weighed to record yield. Fresh harvested mushrooms had high total aerobic bacterial populations. Mushrooms irrigated with normal water (control) had 7.5 log CFU/gm of fresh mushroom tissue. Compared to the control, irrigation with 0.5% hydrogen peroxide or 0.3% calcium chloride consistently reduced bacterial populations by 0.5 log CFU/gm fresh mushroom. While no significant differences in whiteness and color was observed between the control and the treatments on the day of harvest, irrigation with 0.5% hydrogen peroxide and/or 0.3% calcium chloride resulted in significantly enhanced mushroom whiteness and quality attributes after 3 and 6 d of postharvest storage. Results of the experiments indicated that addition of the antimicrobial treatments to irrigation water has good potential as a practical strategy to reduce bacterial populations, and to improve quality of fresh mushrooms.