

MICROBIAL QUALITY AND SHELF LIFE OF HARPIN-TREATED HEAD LETTUCE

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ABSTRACT

The effect of pre-harvest application of Extend®, a newly developed second generation harpin product, on shelf life of fresh-cut lettuce was investigated. The lettuces were grown in locations A: Watsonville, CA; B: Cedarville, NJ; and C: Yuma, AZ, and treated five days before harvest at 140, 280, and 420 g/ha. Lettuce processed and bagged was stored at 2-4°C and evaluated for quality during 20 days at 5-day intervals. Experimental conditions and subsequent results from the three trials varied. Lettuce from trial A treated at 280-420 g/ha consistently had a higher overall quality and lower microbial population than the control. In trial B, where wet conditions prevailed immediately after treatment application and during harvest, few differences among treatments were observed. In trial C, lettuce treated at 280 g/ha had consistently higher quality and lower microbial counts during early stages of storage (data not shown).

Although overall results are mixed, data from evaluations conducted 5 days after processing showed differences in overall quality between control and treated lettuce at all three locations. Differences in microbial population were also observed in trial A and C. In trial B, the control showed the lowest microbial count but no statistical difference was recorded among treatments (Table 1). This study revealed that a field application of harpin improves quality of fresh-cut lettuce under conditions to be elucidated. Our results encourage further studies to determine the influence of environmental conditions on the plant's response to harpin and, demonstrate that agents that elicit hypersensitive response may be used to improve quality of fresh-cut products.

Table 1: The effect of a field application of Extend®, on overall visual quality and mesophilic bacteria count of fresh-cut head lettuce grown in three different locations, 5-6 days after processing.

<i>Locations</i> →	Overall Visual Quality (9-1 scale)			Microbial Population (Log ₁₀ CFU/g)		
	A	B	C	A	B <i>ns</i>	C
Control	7.8 b	5.83 b	7.61 b	5.98 a	6.86	6.81 a
EBC-351 140 g/ha	7.9 b	5.89 b	7.86 b	5.35 ab	6.36	6.64 ab
EBC-351 280 g/ha	8.4 a	6.39 a	8.28 a	5.15 bc	6.26	6.57 b
EBC-351 420 g/ha	8.5 a	6.28 a	8.33 a	5.11 c	6.18	6.78 ab

ns indicates no significant differences among values in the same column; *Values followed by different letters in the same column are significantly different ($P < 0.05$).

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