BLUEZONE®
FRESH PRESERVATION TECHNOLOGY

Demonstration of the Bluezone® Fresh Preservation Technology in a tomato pack room

Introduction

Tests of the anti-microbial performance of the Bluezone® Fresh Preservation Technology Model 2400 have been conducted in a packing shed where hydroponically grown tomatoes are packed and outbreaks of mould have been experienced leading to losses of product.

The anti-microbial performance was evaluated by conducting before and after air sampling at several locations within the pack shed using standard bio-aerosol sampling procedures. Sample plates were then incubated and counts made of the resulting colony-forming units (CFUs).

Equipment & protocol

The pack shed has dimensions of 45m x 35m and a ceiling height of 5.2m giving an air capacity of 8,190 cubic metres. Three Bluezone® Fresh Preservation Technology units were installed by placing these under conveyors and packing equipment. This was recognised as being fewer units than that recommended from earlier research by the manufacturer however there were only three units available at the time the trial was to commence.

A MicroBio MB1 Bioaerosol Sampler (http://www.cantiumscientific.com/MB1.html) was positioned inside the pack shed and connected to a vacuum pump. The sampling procedure was as follows:

- Install a Potato Dextrose Agar (PDA) Petrie dish in the sampler and start the vacuum pump drawing 50 litre of air on to each dish.
- Remove PSA dish from the sampler, put on the lid, tape the join and place in an incubator at 20°C for 72 hours.
- After 72 hours, remove PSA dish and count the colony forming units (CFUs).

It was important to establish a sampling protocol which would produce a high enough number of CFUs under the baseline (no Bluezone®) conditions so that any anti-microbial effect of the Bluezone® can be discerned. Multiple samples were taken at the start and finish of the trial period as by its very nature, microbial testing leads to large variability in data. The air sampling exposure time for all agar dishes was the same as was the incubation time.

Bio-aerosol Sampling Results

Figures 1 and 2 each show three PSA dishes after incubation: the dishes in Figure 1 are from three locations in the pack shed before Bluezone® installation; those in Figure 2 are from the same three locations in the same pack shed five weeks after Bluezone® installation. The mould in Figure 1 was later grown out by extending the incubation time a further three days and the moulds were identified as a mixture of Penicillium and Rhizopus stolonifer.

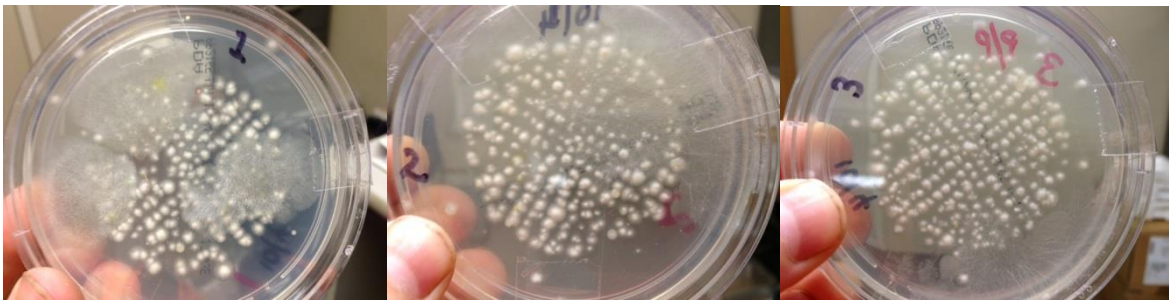

Figure 1 – Sample plates ***before Bluezone***® operation

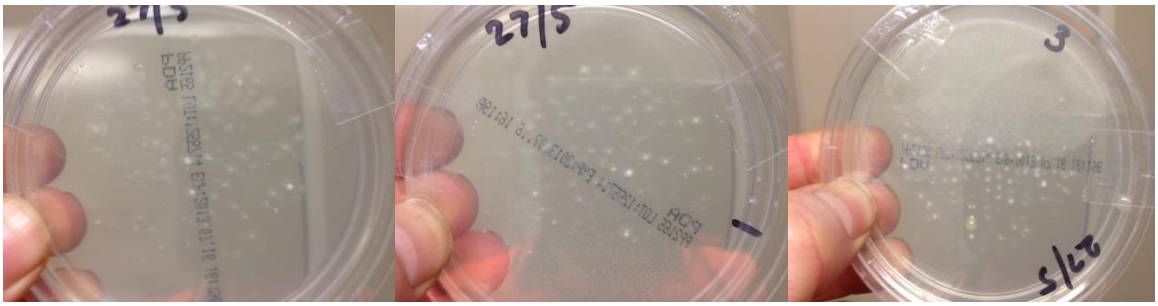

Figure 2 – Sample plates ***with Bluezone***® in operation

Examining these photos shows a clear reduction in number of CFUs with the Bluezone® in operation.

Conclusion

Installation of the Bluezone® units in this environment has resulted in significant reduction of mould CFUs and retardation of their growth time, with quantitative reduction of at least 30% over the duration of the test.