

Tectrol® Treated Fruit more marketable in replicated Competitive Comparison

At TransFRESH® we strive to understand all post harvest treatments and how those treatments may impact fruit quality. Within the strawberry fruit trade, several shippers have adopted a “*non-sealed bag*” system, which offer to protect fruit quality during transit and handling. These processes compete directly with TransFRESH Corporation’s Tectrol® Atmosphere systems, a “*sealed bag*” technology.

TransFRESH just completed a series of *three different evaluations* under controlled conditions pairing fruit from a non-sealed bag systems with fruit from our sealed bag, Tectrol® Atmosphere system. Our executive summary, or abstract, presents the core results. However, since we are committed to the scientific method, the executive summary is followed by a detailed description of our methods and results.

Executive Summary

Three separate demonstrations with three separate shippers were conducted (one in Oxnard, California, and two in Santa Maria, California).

For each demonstration, transit simulations were conducted for 5 days at 34° F. Distribution and market simulations were then conducted for a period of 2 to 3 days at 70° F. In each of these demonstrations, Tectrol® Atmosphere treated fruit out performed the non-sealed bag treated fruit. Based on the evaluations of the demonstrations, fruit serviced with *Tectrol® scored higher and shown to be marketable by at least 3% to as high as 37% (with an average higher score of 25%) after transit and distribution simulations, and the fruit had an average of 11% less decay or deterioration.*

Tectrol Atmosphere vs. Non-sealed Bags

Summary 3 Replications

After 5 days in Treatment at 34°F
plus

2-3 Days Ambient

Oxnard, Santa Maria April-May, 2009

		Tectrol Atmosphere Sealed Bag	Non- Sealed Bag
Retail Simulation	% Would Buy	73%	48%

	% Decay, Wet, Leaky Fruit	40%	51%
Methods	Randomized samples prior to treatments Blind evaluations, random number ID format n = 15 flats per treatment		

Demonstration Procedure

Procedures were structured to help insure: 1) evaluation samples were thoroughly randomized prior to treatment, 2) evaluators did not know which sample treatment any given flat of clamshells had received, 3) pallets remained at the shipper's facility during treatments, and 4) at least one product evaluator was a member of the shipper's quality assurance group.

Three separate demonstrations with 3 different shippers were conducted. Demonstration 1 used fruit from the Oxnard, California area with the final evaluation completed on April 24, 2009. Demonstrations 2 and 3 used fruit from the Santa Maria, California area, with final evaluations completed on May 28 and 29, 2009.

In each of the demonstrations, two full pallets of fruit were provided by selected shippers. Sample and pallet preparation were all done after pre cooling and inside respective shippers cold rooms at 34° F. For each demonstration a total of 5 flats from each pallet unit were selected. To properly randomize and neutralize packing variances created by individual pickers, clamshells from all selected flats were randomly mixed among all sample flats. Each sample flat was then identified with a 5 digit random number. Five (5) boxes were then restacked on each of the two paired pallets. Random numbers were recorded and associated with respective pallets. Box heads with random numbers were turned "inward" (carton face to carton face) so numbers could not be visible during the treatment period. Random number data was secured inside a sealed envelope for future (end of evaluation) reference and given to the cooperating shipper for safe keeping.

One pallet was then bagged, sealed and gassed with Tectrol® Atmosphere, using available equipment. The second pallet was covered with a non-sealed bag system. Per manufactures specification NO SEAL was applied to the bottom of the non-sealed bag product.

Simulated transit period was 5 days at 34° F. During the transit simulation average level of CO₂ (carbon dioxide) in the Tectrol® bags was between 13-18% CO₂ (USDA recommendation is 10% CO₂ or higher). Average level of CO₂ in the non-sealed bag was 0.6%.

After 5 days, bags were removed and all sample flats retrieved, randomly placed on a pallet, and moved to an ambient room or warehouse. To simulate the affect of the break in cold chain during the retail display, consumer purchase and transport home, the samples were held for 2 or 3 days at 70°F+/-.

On day 2 or 3, all samples were evaluated. Evaluators included TransFRESH personnel and at least one shipper employee from the shipper's quality assurance group. First, each clamshell was scored for retail marketability based on a 1 to 5 scale. A score of 3 or less indicated the evaluator would likely buy a specific clamshell. A score of 4 or higher would indicate the evaluator would likely not buy a specific clamshell due to visible decay or deteriorated fruit conditions. Next, each clamshell was opened and all berries sorted for visible decay or good condition. ***The evaluations were conducted by random number flat codes. Under no circumstances were TransFRESH or shipper personnel who conducted the evaluations of the fruit able to identify treatments based on random number flat codes.***

After all evaluations were completed, the envelope containing the random number treatment codes was opened and data sheets sorted according to treatment.

Results

Tectrol Atmosphere vs. Non-sealed Bag

Summary 3 Replications

After 5 days in Treatment at 34F
 plus
 2-3 Days Ambient
 Oxnard, Santa Maria April-May, 2009

		Location	Evaluation Date	Tectrol Atmosphere	Open Bag
Market Purchase Decision	% Clamshells, Would Buy	Oxnard (#1)	April 24	67%	30%
		Santa Maria (#2)	May 28	95%	92%
		Santa Maria (# 3)	May 29	58%	22%
		Summary (All)			73%
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	% Decay, Wet and Leaky	Oxnard (#1)	April 24	42%	57%
		Santa Maria (#2)	May 28	24%	32%
		Santa Maria (# 3)	May 29	54%	65%
		Summary (All)			40%

Methods Randomized samples prior to treatments
 Blind evaluations, random number ID format
 n = 15 flats per treatment

Conclusion

In all three (3) demonstrations, the high CO₂ component of Tectrol® Atmosphere (as recommended by the USDA) clearly protected the fruit quality. Although the results varied in score, each showed Tectrol® treated fruit in clamshells were judged to be more marketable after the transit and distribution simulation by an average higher score of 25%. Decay or deteriorated fruit condition was reduced by an average of 11% in Tectrol® treated fruit.