

The St=Pack=er NEWSLETTER



Xtend® Modified Atmosphere Packaging

Issue 27 | Winter 2016

From the Editor's Desk

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StePac at Fruit Logistica, 2016!

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Xtend Packaging keeps Blueberries fresh under all conditions!

Xtend Packaging is the perfect solution for preserving blueberry freshness, enabling growers and exporters around the world ample time to reach distant markets and enough flexibility to store and distribute the produce thereafter.

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Reduction of chilling injury in 'Wonderful' pomegranate fruit by temperature conditioning treatments

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Xtend Packaging for Cherries

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From the editor's desk



By Deborah Meidan



Dear readers

Welcome to the winter issue of our newsletter, where we are featuring articles about recent trade show Fruit Logistica and the exciting products that we showcased there this year! We thank everyone that stopped by our booth for a chat, it was a

pleasure!

Featured in our booth in Berlin was our new company video that gives a fascinating summary of how we meticulously design, develop and produce our products at StePac's state of the art post-harvest laboratory and factory was proudly presented for the first time in Berlin; watch our video now!

<http://tinyurl.com/pcmn73d>

Also appearing in this newsletter's issue are articles on innovations in MA/MH packaging for blueberries and best freshness preservation practices for cherries and pomegranates which we believe will all be of great benefit to customers who deal with these high value produce items!

If you are not already receiving StePac's informative and interesting newsletter on freshness preservation, then please visit the link below and register easily to receive our quarterly publication:



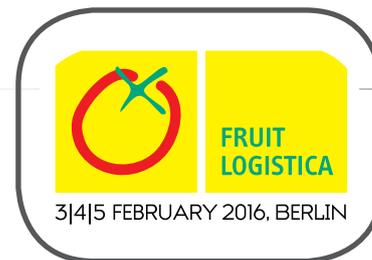
I welcome your feedback and wish you a pleasurable read.

Best Regards,
Deborah Meidan

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StePac returned to Fruit Logistica with a new parent company & exciting prospects for the future!



By Deborah Meidan & Dr. Gary Ward

StePac recently returned to Fruit Logistica for the 18th consecutive year, for the first time under the ownership of Johnson Matthey after being recently acquired by the global leader in sustainable technologies in May, 2015. "Fruit Logistica was a perfect stage for us to share the exciting opportunities that this new beginning offers, in particular the prospects for further advancement of our packaging products by combining functionalities developed by Johnson Matthey's Technology Centre." says Rani Kadosh, StePac's Sales & Marketing Manager.

At Fruit Logistica 2016, StePac showcased its core produce packaging for prolonging

freshness of over 60 different fruits and vegetables with a few new improved applications for high value produce items such as blueberries.

Alongside StePac's standard blueberry packaging that provides impressive freshness extension for blueberries maintained under supply chain temperature conditions of between 0-2°C, the company's R&D team has developed a unique new Xtend packaging for blueberries that is designed to withstand dramatic temperature fluctuations that are prevalent in some markets.

"The increased global demand for blueberries has necessitated the development of a unique solution that can preserve

freshness and quality under the most challenging of supply chains. We were very excited to unveil such a new ground breaking packaging solution at Fruit Logistica." says Dr. Gary Ward, Technical Development Manager, "A lot of interest was shown in our products, we are optimistic that some of this interest will develop into new business. Our sincerest thank you to everyone who visited our booth this year; it was a pleasure to meet you all and we look forward to assisting you whenever you need our products and service!"

Interested in hearing more about Xtend MA/MH packaging? Send an email to info@stepac.com.



Xtend Packaging keeps Blueberries fresh under all conditions!



By Deborah Meidan & Dr. Gary Ward

Propelled by public awareness of its superfood status, blueberries are arguably the fastest growing fresh fruit item in the produce industry right now. Reports indicate that consumption of blueberries in 2015 in the UK were up by 1/3 on the previous year! (1).

Xtend Packaging is the perfect solution for preserving blueberry freshness, enabling growers and exporters around the world ample time to reach distant markets and enough flexibility to store and distribute the produce thereafter.

Unlike controlled atmosphere (CA) containers, the effect of which is lost immediately after opening the container upon arrival at the destination market, as long as Xtend

packaging remains sealed, the modified atmosphere effect is maintained. This offers obvious advantages, providing importers with more flexibility in storing and distributing the produce upon arrival. With CA containers, the blueberries are often treated like hot potatoes, since quality can deteriorate rapidly after removing from CA.

Standard Xtend packaging for blueberries is designed to provide optimal modified atmosphere and condensation control during storage and shipment at the recommended temperatures of 0-2°C. However we realized, that depending on the market retaining strict temperature regimes can be challenging in certain markets. Therefore, in addition to our established standard Xtend

packaging for blueberries, our R&D team, has developed a new Xtend solution for blueberries, designed to preserve freshness in and provide outstanding performance during the most challenging of supply chains, in which temperature swings are noticed.

This new Xtend packaging for blueberries, engineered to tolerate temperature fluctuations was extensively tested in commercial trials last year with exciting results. In arrivals of blueberries from Chile to major Chinese market hubs in Guangzhou and Shanghai, blueberries packed in Johnson Matthey's Xtend packaging consistently arrived in excellent condition, superior to that of fruit packed in competitor bags. "In all of the inspections that



Fig 1: Xtend packaging containing blueberries upon arrival in China. Note the lack of condensation and high clarity of the film, both of which make the produce easily visible.

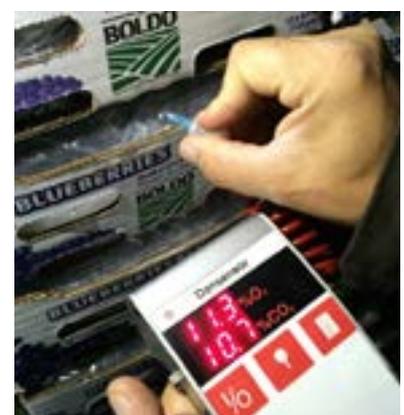


Fig 2: Measuring gas compositions upon arrival in China.

1. <http://www.theguardian.com/lifeandstyle/2015/aug/23/british-berry-sales-liquidiser-revolution-blueberries-raspberries-nutribullet>

we conducted, (Figs 1 & 2), fruit visibility was outstanding due to the ability of Xtend to remove excess moisture” reported Ivo Tunchel, StePac South America Commercial Manager. “We were delighted to see that fruit was firm and there

was no evidence of fruit rot on account of condensation control and optimal gas compositions. Blueberries packed in Xtend bags remained crunchy, sweet and were in excellent commercial condition.”

In stark contrast, when not engineered to withstand temperature fluctuations, competitor MA/MH packaging does not perform well, (Fig 3).

Most importantly, appearance, taste and texture of fruit stored “Providing the customized packaging to meet the needs of our customers is at the heart of our business, says Dr. Gary Ward, Technical Development Manager, “we feel confident that our two types of Xtend Modified Atmosphere & Condensation Control packaging for blueberries will give our clients the flexibility they need to consistently deliver high quality produce regardless of the given supply chain conditions.”



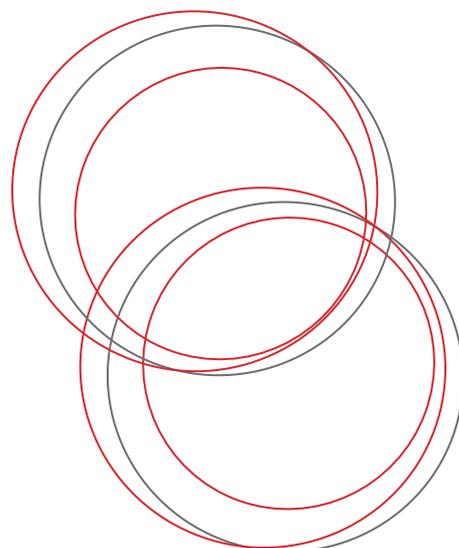
Fig 3: Competitor arrivals showed substantial rot due to high condensation and suboptimal gas compositions in bags.

The new packaging is being used right now for commercial shipments of blueberries from Chile to China and as we write this article, StePac representatives are visiting markets in China and inspecting the quality of the berries and performance of the packaging to report back to the Chilean customers.

Selection of blueberries arrivals inspections at Guangzhou Market, China.



For more information about Xtend packaging, contact us, info@stepac.com.



Reduction of chilling injuries in 'Wonderful' pomegranate fruit by low temperature conditioning treatments

By Ron Porat, Dept. of Postharvest Science of Fresh Produce, ARO, the Volcani Center, Israel.

Introduction

Pomegranate fruit, c.v. 'Wonderful', are susceptible to chilling injury (CI) and should ideally be stored at temperatures ≥ 7.5 °C for prolonged storage in excess of 2 months. CI symptoms in pomegranates are manifested as brown discoloration and development of necrotic areas (pitting) on the peel, and browning of the white fleshy mesocarp tissue and segments surrounding the arils (Fig. 1).

Application of cold quarantine treatments, such as against the Mediterranean fruit fly *Ceratitis capitata*, for export of pomegranate fruit to fly-free zones, necessitates exposure of the fruit to very low temperatures of below 1.1 °C for at least two weeks. Therefore, in order to extend the postharvest storage life and promote global trading of pomegranate fruit to fly-free zones, it is necessary to develop efficient postharvest treatments that will enhance

fruit chilling tolerance and prevent the development of CI upon exposure to low storage temperatures.

It is known that exposure of horticulture produce to low temperatures slightly above their critical chilling range for a certain duration increases their tolerance towards subsequent exposure to low temperatures; a process termed "temperature conditioning" (TC). The goal of this study was to evaluate the efficacy of various TC treatments comprising different combinations of temperatures and storage durations on chilling tolerance of 'Wonderful' pomegranate fruit.

Materials & Methods

'Wonderful' pomegranates (*Punica granatum* L.) were purchased from a commercial packinghouse, in which the fruit were sorted, sprayed with 0.15% Scholar, and packed in commercial Xtend MA bags in 5kg cartons. Afterwards, the fruit were either stored at 1 °C for 4 weeks, or were

conditioned at various temperatures of 5 - 15 °C for various periods of 1 - 3 weeks before transferring to a cold storage of 1 °C for 4 weeks. After cold storage, the bags were opened and the fruit were kept for one more week under shelf-life conditions at 20 °C. Since pomegranate fruit may suffer from external browning (scald) due to other causes beside low temperatures, we evaluated CI development as the percentage of fruit with internal browning symptoms. Each treatment included 4 cartons, each containing 9-10 fruits. The experiments were conducted in 2013 and 2014 pomegranate seasons.

Results

In the 2013 season, we evaluated the effects of exposure of the fruit to various TC treatments, including pre-storage at different temperatures of 5, 10 and 15 °C for various periods of 1, 2 and 3 weeks before subsequent exposures to a low temperature of 1 °C for 4 weeks. The results show that between 60 to 70% of the control unconditioned fruit or of fruit conditioned at the low temperature of 5 °C suffered from CI (Fig. 2). However, pre-storage conditioning at 10 and 15 °C dramatically reduced the appearance of CI symptoms. For example, pre-storage conditioning at 10 °C for 2 and 3 weeks reduced CI incidence to just 3-6%, and



Fig 1: Chilling injury symptoms of 'Wonderful' pomegranate fruit.

pre-storage conditioning at the higher temperature of 15 °C for 2 and 3 weeks entirely prevented the development of CI (Fig. 2).

Based on these findings, in the 2014 season, we decided to evaluate the efficacy of pre-storage conditioning treatments at a more narrow range of 10 -16 °C for various durations of 7 -14 days. As for the previous experiment, we observed that 60% of the control non-conditioned fruit suffered from CI (Fig. 3). Regarding the various TC treatments tested: it was found that the pre-storage conditioning treatment at the

lower temperature of 10 °C was somewhat less effective. However, pre-storage conditioning at 13-16 °C for 10 and 14 days almost entirely prevented the appearance of CI damage (Fig. 3). The photographs provided in Fig. 4 present the visual appearance of control unconditioned fruit that suffered from internal browning as compared with fruit conditioned at 13 and 16 °C for 10 days, the mesocarp of which remained white and healthy.

Conclusions

Pomegranate fruit, c.v. 'Wonderful', are susceptible to

development of CI following low temperature storage. In this study, we evaluated the efficacy of various pre-storage conditioning treatments, and found that pre-storage exposure of the fruit to moderate temperatures of 13-16 °C for durations of 10-14 days almost entirely prevented the development of CI symptoms during subsequent 4-week cold storage period at 1 °C! Such TC treatment could be employed prior to cold quarantine shipments, thereby enabling shipment of pomegranates to Mediterranean fly-free zones.

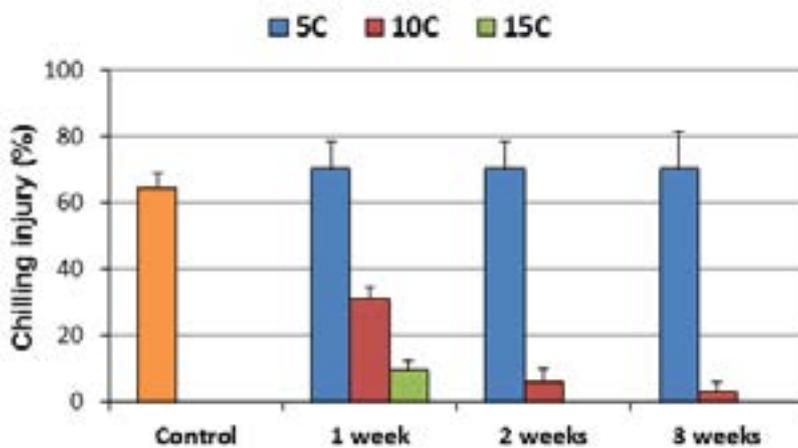


Fig 2: Effects of pre-storage conditioning treatments on chilling injury incidence of 'Wonderful' pomegranate fruit. The experiment was conducted in the 2013 season. Fruit were kept untreated (control) or conditioned at temperatures of 5, 10 and 15 °C for 1, 2 and 3 weeks, before storage at 1 °C for 4 weeks. CI was evaluated after an additional week at shelf-life conditions of 20 °C. The results are presented as the mean ± S.E. of 4 cartons per treatment, each containing 9 fruit.

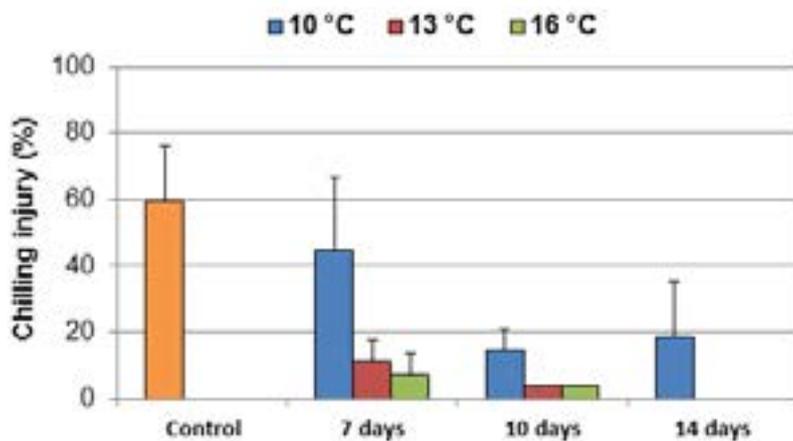


Fig 3: Effects of pre-storage conditioning treatments on chilling injury incidence of 'Wonderful' pomegranate fruit. The experiment was conducted in the 2014 season. Fruit were kept untreated (control) or conditioned at 10, 13 and 16 °C for 1, 2 and 3 weeks, and afterwards stored at 1 °C for 4 weeks. CI was evaluated after an additional week at shelf-life conditions of 20 °C. The results are presented as the mean ± S.E. of 4 cartons per treatment, each containing 9 fruit.



Fig 4: Photographs of control untreated 'Wonderful' pomegranate fruit and of fruit conditioned for 10 days at 13 and 16 °C after 4 weeks of cold storage at 1 °C plus 1 week at shelf-life conditions of 20 °C.

Xtend® Packaging for Cherries- Globally Yours



By Dr. Gary Ward

It is well known that low O₂ and elevated CO₂ concentrations reduce respiration rate, inhibit ethylene (the plant hormone responsible for aging and ripening processes) and inhibit microbial growth (if the CO₂ concentration is sufficiently high) of many fresh produce items. These are the underlying principles of equilibrium modified atmosphere packaging, which is frequently used in the fresh produce industry for preserving the freshness of those fruits and vegetables for which it provides sufficient added value.

Cherries are a high value produce item which benefit from equilibrium modified atmosphere packaging, and the technology has been in use for many years in the cherry industry.

Based on the aforementioned principles, Xtend modified atmosphere packaging has been

designed to effectively inhibit decay & pitting, maintain stem color and preserve the natural color and taste of cherries, all contributing to higher quality fruit and lower waste in the supply chain (Fig.1)

Available as carton liner bags (Fig.2), preformed retail bags and flow pack, when coupled with appropriate post-harvest protocols, Xtend packaging for cherries can achieve a combined storage and transportation life of in excess of 30 days, depending upon variety. This opens up new opportunities for cherry growers and packers alike.

“For cherries, we have developed films with excellent condensation management properties, proven to tolerate the most challenging temperature fluctuations during the supply chain”, says Gary Ward, StePac’s Technical Development Manager.

“The packaging also provides beneficial and stable modified atmosphere conditions even under challenging temperatures” adds Gary. “We aim for sufficiently low O₂ and high CO₂ to reduce respiration and preserve freshness and yet sufficiently high O₂ to sustain aerobic respiration in the event that there is temperature abuse”.

Table 1 shows measurements of gas readings and temperature in a shipment of cherries from Turkey to one of Moscow’s fresh produce markets, where the temperature management is far from being optimal.

Xtend packaging for cherries is one of StePac’s longest running products and the company has been marketing and selling the product for over 15 years.

Today, it is being used in many countries worldwide, including Austria, Belgium, Bulgaria,

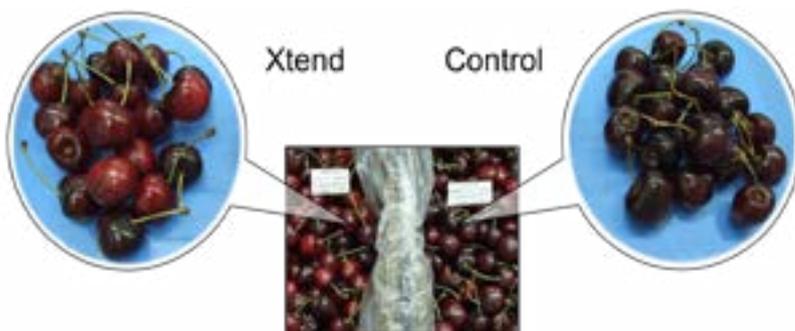


Fig 1: Bing Cherries after 21 days at 0-2°C + 3 days at 10°C



Fig. 2: Xtend carton liner

Xtend - no condensation

competitor's packaging - profuse condensation



Fig. 3: Good condensation management properties in Xtend (left) vs. poor condensation management properties in competitors packaging (right)

Chile, Greece, Holland, India, Israel, Italy, Norway Poland, Spain, Turkey and the USA. Applications range from preserving the quality during shipment from Turkey across Europe to prolonged storage for up to 3 weeks at the end of the season in Germany.

Packaging performance is highly dependent on post-harvest handling and StePac adopts a

systems approach and works closely with its customer base to make sure that they adhere to best post-harvest practices in order to optimize packaging performance. "Over the years, we have gained considerable know-how on the optimal post-harvest handling of cherries, which we share with our customers to bolster the performance of our packaging" says Prof. Tayfun Agar,

one of StePac's Post-harvest specialists based in Turkey, who has been working with Turkish exporters of cherries for over 13 years

For more information on this and other Xtend products, write to us: info@stepac.com

		Pallet at the front of the container	Pallet in middle of the container	Pallet at the rear of the container
Xtend for 5 kg cherries	O ₂	9.6±1.7	9.7±0.3	11.7±2.9
	CO ₂	7.6±0.5	7.4±1.4	8.8±3.4
	Temperature of cherries in representative bag	9.7°C	8.8°C	8.4°C

Table 1: Gas readings in Xtend containing Ziraat cherries upon arrival of shipment from Turkey to Moscow. Results are presented as average ± standard deviation of 10 readings in each pallet. Note the high temperature readings.



Fig. 4: Measuring gas readings in Xtend packaging