ZERAIM GEDERA
The Seed Company

SEASONS & TASTES

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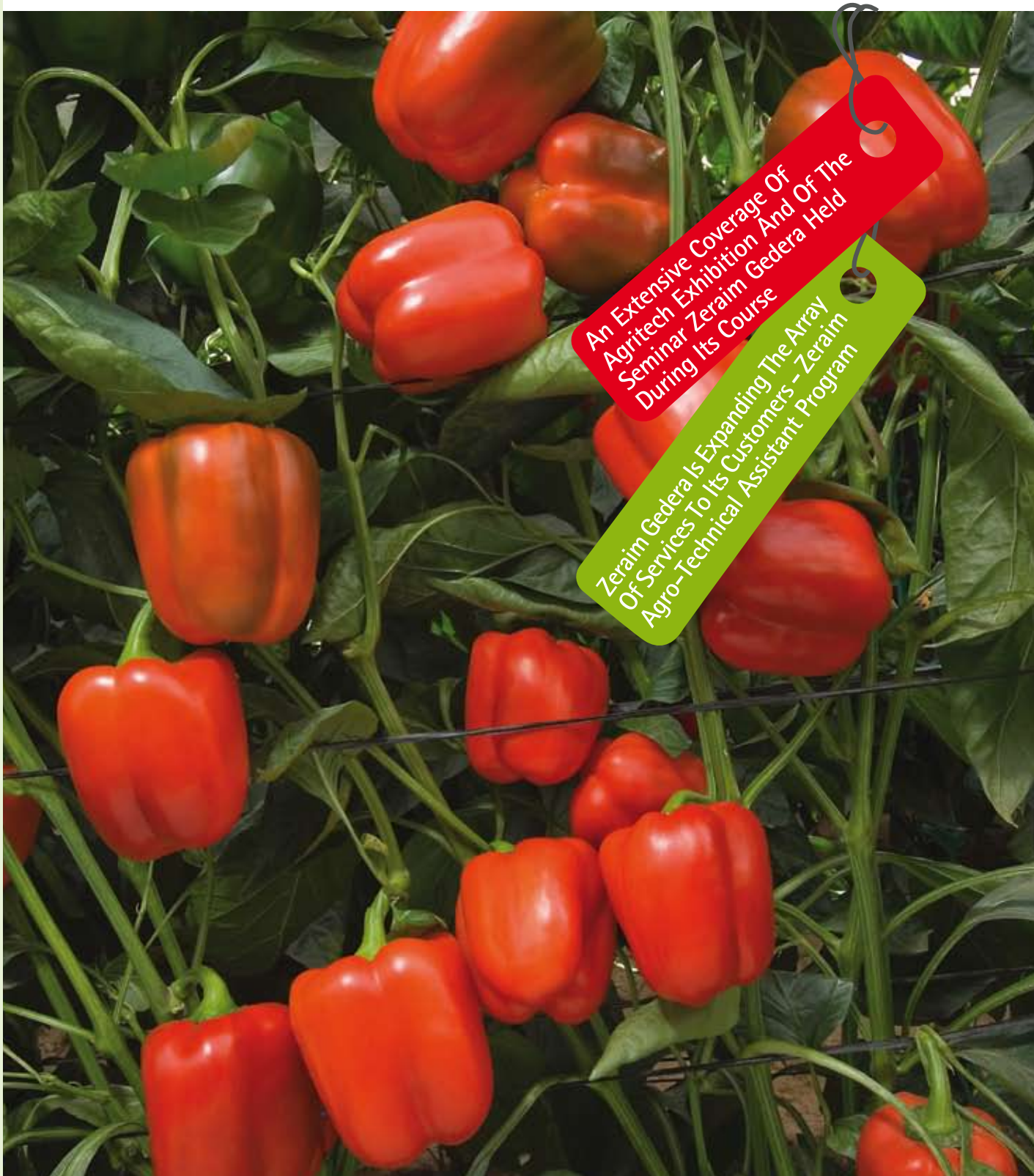

An Extensive Coverage Of Agritech Exhibition And Of The Seminar Zeraim Gedera Held During Its Course

Zeraim Gedera Is Expanding The Array Of Services To Its Customers – Zeraim Agro-Technical Assistant Program

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From the editor's desk

"The impact of the recession includes supply chain fall out. Consumers are nervous and good value for money becomes essential. In the future, competition will be mainly between retail chains rather than between countries. Therefore, it is very important to export to the strong competitive chain stores, rather than to a specific country. You need good partners – now more than ever, retain your best people, make better use of risk management tools and control costs, and the niches that are under pressure".

In an spectacular presentation at the "Fresh Produce Marketing in a Changing Economic Environment" seminar *Zeraim Gedera* held during Agritech 2009 in Tel Aviv, Israel last May, Mr. John Giles, Divisional Director at Promar International from the UK, gave the audience the European perspective to the world economic crisis, offering business advise to the entire food supply chain.

In times of recession, we do not forget our clients. When every tomato, pepper or watermelon counts for the grower to receive the highest possible yield from the crop and, consequently in the stores, we offer our customers additional services. One of these services is our ZAAP (Zeraim Agro-technical Assistant Program) team of highly professional agronomists who assist growers worldwide, addressing the professional questions raised, to assure highest possible yields.

This 14th issue of "Seasons & Tastes" brings you broad coverage of the seminar and recommendations from the best professionals in the field of fresh produce in the US, Europe and Israel as well as a glance at the assistance our team offers to our growers worldwide.

Enjoy!

Yours,
Nitzan Kadmon, Editor
Email: nitzan.kadmon@zeraim.com

NEW OPPORTUNITIES

FOR *ZERAIM GEDERA* IN THE PIPELINE

Interview with Amnon Eshet, Head of Zeraim Gedera, two years after the Company's acquisition by Syngenta

In retrospect, after 2 years, what was the change like for you, being from a *Zeraim Gedera* manager to becoming a member of the giant Syngenta?
Zeraim Gedera is a full part of Syngenta today.
We manage the company under global management standards and the employees feel that they are part of a bigger organization.
As expected, it's not always easy, but I think that the integration process was been and is being carried out very professionally. I think that Syngenta is allowing us to keep the spirit we managed to develop and at the same time to develop the understanding of being part of a bigger organization.

We are working closely with our customers to provide them with better agro-technical services in order to help them get the best out of our genetics.

How do you feel as part of Syngenta?
I feel it's a great opportunity for me as a leader and for the company. Being part of a successful leading agro-business organization provides us with peace of mind, especially during times like these, of economic crisis, and at the same time it stretches us and requires better performance from all of us.

Two years down the road, how would you define the change?
The "Change Management Process", which aims to change our mindset from a relatively small independent company to a unit within a larger organization, is the main change we are going through.
We learned how to work within a big matrix, how to engage with more people who speak different languages and come from different cultures. This helps us to develop new communication skills, depend on capabilities of others and better understand what we can contribute to the bigger organization.

The world has been experiencing a severe financial crisis over the past year. How does this affect the seed industry in general and *Zeraim Gedera* in particular?
The need for food supply remains the same and the future challenges are ever greater.
In the vegetable industry we have seen some changes in demand (such as lower demand in food service or, in some instances, a reduction in demand of specialty/gourmet items), but the overall future looks very promising. The main challenge in today's economy is credit risk management, which requires careful and detailed planning. We, therefore, continue planning our growth as originally decided.

How does the company intend to deal with the crisis?
We are taking prudent steps in terms of credit risk and trying to monitor collection very closely.
At the same time we are working closely with our customers to provide them with better agro-technical services in order to help them get the best out of our genetics.

How do you percieve the future development of the seed business, and where do you see *Zeraim Gedera* in this future outline?
I think *Zeraim Gedera* has a lot to contribute to the future development of Syngenta. We need to continue thinking out of the box and develop innovative ideas in all business aspects.
We need to seek for a better offering to our customers (growers, shippers, retailers and above all consumers), we need to improve seed quality and at the same time improve the efficiency of how we manage the company. I believe that if we all focus on these future needs, we will definitely have a bright future.

In his recent lecture at the "Fresh Produce Marketing in a Changing Economic Environment" conference *Zeraim Gedera* held during the Agritech 2009 exhibition, John Giles from Promar International expressed his view that especially during such an economic crisis one should invest more in R&D. What is your opinion on that?
I think he is right. We need to manage the short term challenges, but at the same time understand the long term opportunities we foresee. As I said before – the demand for more and better food is increasing rapidly and the arable land and water resources are decreasing very fast. I strongly believe that innovation is the heart of our business and investment in R&D is the core of it. We need to have a long term view and understand that the sustainability of our company is depending on our creativity, innovative thinking alongside with short and long term best practice management.

It's been 2 years since the acquisition, has there been a change in the R&D work process? Are there going to be any changes in the future?
We agreed to find the best way to manage the R&D resources and to look for a way for breeders to cover the most relevant segments in the most efficient way. Syngenta is building one global R&D community that will supply products for all brands. This integration process is not always easy and requires a lot of patience, nevertheless I feel that we are moving in the right direction and that Syngenta will benefit from the young and passionate R&D team of *Zeraim Gedera*.

Amnon sums up the interview with a personal note: I wish all our business partners and our customers a successful growing season. We are here to support you with your needs and helping you choosing the best product from our vast range of varieties.

A CULINARY EXPERIENCE AT *ZERAIM GEDERA*'S BOOTH AT AGRITECH

Growing tomatoes in extreme weather conditions is no easy task, but over the last 30 years or so, Israeli agriculture technologies have been designed to cope with whatever Mother Nature throws at them. It has taken special software, innovative dew collectors, novel fruit and vegetable varieties, drip irrigation, integrated pest control tactics and state-of-the-art greenhouses.

Faced with the region's desert climate, Israeli agronomists, entrepreneurs, academics and government agencies started focusing on agriculture primarily as a means to survive. The fruits of their labor were on show at the 17th Agritech exhibition, held May 5th-7th in Tel Aviv.

The fair drew 231 exhibitors - 175 of them Israelis and the rest from abroad - and over 30,000 visitors, both foreign and local. As opposed to previous Agritech exhibitions, the impression was that there were fewer visitors this year (perhaps due to the economic crisis). Nevertheless, the Seed Companies hall enjoyed a large flow of people throughout the fair.

Zeraim Gedera professionals - ranging from product managers to breeders to marketing managers - were present throughout the exhibition, welcoming and meeting the wide variety of people who came to our booth. Our visitors included growers, retailers, exporters and fresh produce wholesalers, as well as delegations from all parts of the world, new and existing contacts. All our guests enjoyed the fascinating vegetables display, tasting and relishing our diverse tomato segments.

Zeraim Gedera's Roma type tomato, displayed at the fair, "enjoys a great taste, high yield and is intended to be consumed in salads as well as snacks throughout Europe", says Gerry Kelman, *Zeraim Gedera*'s Marketing Manager, VIM (Vertically Integrated Marketing).

Single and cluster tomatoes were on show, as well as cherry tomatoes such as the single, cluster, tear drop and taste varieties.

"One of these varieties is our tear drop-shaped cherry tomato, recently named Gocha", says Gerry, "which is intended to be used for vegetable salads and to be consumed as a snack around Europe. The fruit enjoys exceptional balanced taste, extended shelf-life both on the plant and post-harvest, and a rather unique shape. At the same time, the plant carries a heavy yield of fruit. Reactions have been amazing; a business colleague of mine from the UK has told me that he cooked Gocha and found that it has a perfect and distinct tomato flavour with a correct juiciness for cooking."

Zeraim Gedera's baby cucumbers were a big hit at the show and were consumed frequently by the guests. Also, the red, orange and yellow blocky peppers were arranged in bowls that surrounded the booth.

> Our visitors included growers, retailers, exporters and fresh produce wholesalers, as well as delegations from all parts of the world, new and existing contacts.

It wasn't just star-shaped squash and variously colored peppers at the center of attention at this year's convention. The dramatic rise in food prices, as well as global warming and the increasing lack of precipitation, has made agriculture the hottest topic worldwide. And so, many countries are searching for methods to increase agricultural output and reduce water consumption.

"The emphasis was on the water supply crisis, both for drinking and agriculture, which is becoming a decisive factor in the foodstuffs issue," explains Danny Meiri, Chairman of the Agritech convention. "The spotlight is now on efficient usage of resources and produce varieties with a longer shelf-life."

As someone who has been involved in such conventions since 1996, Meiri noted, "This year, more so than in the past, foreign visitors to the convention were much focused businesspeople, who knew how to ask the

right questions and were guided towards the most appropriate meetings. The atmosphere in the hall was all business."

Many delegations made their way to the *Zeraim Gedera*'s booth and visited our company's site, including those from Uzbekistan, Georgia, Azerbaijan, Brazil, India and more. The large Brazilian delegation was composed of growers, fresh produce wholesalers and Ministry of Agriculture officials. As a major tomato producers' market, the Brazilian delegation was very interested in our tomato portfolio, with its wide range of segments. In a well presented lecture, the delegates heard about our different segments and were exposed to our TYLCV-resistant varieties, which address a problem local Brazilian growers are currently facing. During their tour of the company's plant and labs, the delegates also had the opportunity to get a better understanding of *Zeraim Gedera*'s seed supply chain.

The company's booth was designed as a salad bar that enabled visitors to taste our shining stars, a unique interactive dining experience with diverse flavors and a friendly, informal atmosphere. Everyone was able to create their own entrée from an amazing variety of fresh, seasonal ingredients, including a variety of *Zeraim Gedera*'s tomato and cherry tomato types, our freshly cut, colorful blocky peppers, cucumbers and sweet corn. Chef Ben Buchwaic, an international-style Israeli kitchen talent, enriched the diners with his unique variety of freshly cut salads.

"IN SUCH AN ERA OF GLOBAL ECONOMIC CRISIS, IT IS CERTAINLY ADVISABLE TO MAINTAIN THE INVESTMENT IN R&D AND BRANDS"

In a conference titled "Fresh Produce Marketing in a Changing Economic Environment" that Zeraim Gedera held on the sidelines of the Agritech 2009 exhibition in Tel Aviv on May 7th, Mr. John Giles, Divisional Director at Promar International, enriched the listeners with the European perspective to the crisis Mr. Jess Ennis, Director of Productores de Hortalizas magazine, presented the listeners the consumption trends in the US. And Professor Oren Kaplan addressed the issues of marketing and consumer behaviour.

"We need 50% more food to feed the world and [we need to] use 30% less energy to do this," commented Giles in a spectacular lecture that opened the interesting seminar. Elaborating on the challenges of food production, adding that we need to use 50% less water, he said that consumers waste 40% of food produced.

"The good news", said Giles, "is that the EU imports large volumes of fruit and vegetables." But the bad news, according to Giles, mainly for non-members of the EU, is that the imports are preferably from EU growers. Given these figures, it was newsworthy hearing that, at the same time, the EU's 490 million (relatively affluent) consumers - the largest single bloc in the world, highly concentrated and by no means uniform in any respect - accounts for almost 50% of Israeli food exports.

According to Giles, growers and retailers around the world should put more effort into the emerging trade zones, the Americas, the Afro-Europe zone and Asia. He also added that the World Trade Organization predicts a 10% decline in the demand for imported fruits and vegetables, that competition from other countries will increase, that food processing from India and China will be the threat of tomorrow, and that India specifically will be a significant player in the future market for the export of fresh produce.

A slump in demand comes from intelligent purchasing. The consumer buys what he needs according to thoughtful calculation ... it is important to brand products

2009 found the EU consumer concerned with a variety of issues, such as fair-trade practices that guarantee a better deal for Third World producers, the rainforest alliance, working with the Carbon Trust, etc.
John Giles called for maintaining investment in R&D and brands. Retailers, according to the Promar Director, should expect quality and availability, innovation, year-round supply, GAP and provenance of produce, training and staff development, exclusivity, environmental benefits, market and consumer research, advice and safety. Growers and exporters must know, according to Giles that certificates like those of GlobalGap, Soil Association organic standard, and the British Retail Consortium have become facts of life.
The world economic recession generated great interest, as well, during the *Zeraim Gedera* seminar.

"The impacts of the recession," said Giles, "are fall out from the supply chain, consumers are nervous, and good value for money becomes essential. There will be some winners too. [When] volatility becomes the norm, cash is tight and debt is bad, you need good partners. Now more than ever, retain your best people, [make] better use of risk management tools and control costs, as the niches are under pressure."

In the future, according to Giles, the competition will be mainly between retail chains more than between countries. Therefore, it is very important to export to the strong and competitive chain stores, more than to a specific country Moreover, the "non-discount" chains have changed their strategy to opening discount stores as well, in order to compete with the German discounters such as ALDI and AHOLD and, consequently, strengthen the competition of the chain stores in the EU market.

"AMERICANS DINE MORE AT HOME"

In a well presented lecture, Jess Ennis, the second speaker at the seminar, took us on a tour inside the minds of the American fresh produce consumer

"Spilling over from ethnic communities (especially Latin and Asian ones), we're consuming more exotic and tropical fruits and vegetables. Also, the key word is 'convenience'; even at home we want good and fast food - "Grab-n-Go."

One of consequences of the Salmonella outbreak that struck North America last year is the importance the American consumer places on the focus on health, safety and traceability. "We are turning green," said Ennis, "with a growing demand for organics."

The economic recession, deeply felt in the US, has made Americans more concerned about prices in supermarkets. "More Americans grow their own," Jess indicated, giving the Obama family as an example.

"THIS IS THE TIME TO INTRODUCE NEW PRODUCTS AND BRANDS"

"Services that companies will offer at this time of crisis, which will become the added value for the consumer, are the key to maintaining stability during this period," according to advice offered by Professor Oren Kaplan to the attendees present in the hall "As there are more constraints, we will need to be more creative Remember that during a crisis, the consumer will be more open to new habits of consumption, if it is in the form of services, lower prices, etc In such periods as these, when constraints increase, creativity will also increase, and so," he explained, "this is the time to introduce new products and brands."
At the same time, Kaplan believes, it is important to understand that at a time of economic crisis,

the consumer's approach changes and he invests more thought in his purchases, which become less impulsive and more rational. A slump in demand comes from intelligent purchasing. The consumer buys what he needs according to thoughtful calculation.

When asked about price levels during a recession, Kaplan replied that a drop in price can sometimes create a psychological difficulty. Consumers, he said, quickly get used to the lower prices, but the return the original prices may make them suspicious of the retailer.

Like Giles, Prof. Kaplan noted that it is important to brand products that in the past were not branded, because one of the functions of branding is to sell the consumer a fantasy, and fantasy increases demand. The thinking has to change from one of products to one of brands. Kaplan advised his listeners to distinguish their brand from other products on the shelf; that is, the branding need not be of the product, but of the producer. It is important to understand that the promise behind the branding must be authentic, as today's consumers are sophisticated, and even more so during an economic crisis, with access to many sources of information. Untrustworthy information will harm the brand over time.

Food market chain stores have been seeing a steep increase in recent years in the use of private labels, "which is lowering costs to the consumer by an average of 15%," Prof. Kaplan said.

When asked about future methods to grapple with the economic situation, Kaplan advised to try and understand current market trends, such as organic foods and the like. Novelty, he said, is not due to the producer understand what the consumer wants, because the consumer does not necessarily know what he wants. Similarly, creative thinking must also be expressed in collaboration - what is difficult to accomplish as an individual organization may be possible through a joint business venture. Such partnerships can even be formed with competitors - using common service platforms and competing for the consumer

Doron Ovitz, a pepper grower and exporter from the Amioz community, who attended the seminar, said that the lectures, as well as the opportunity to raise burning issues, allowed him to get a bit wider picture of the market crisis and to discover new marketing horizons.

"I was particularly interested in hearing Johh Giles and his forecasts for global and the Israeli agriculture in the next decade," Ovitz said.

Our Guests Are Ministers Of Agriculture

At the international agricultural exhibition, Agritech, held in Tel Aviv, the *Zeraim Gedera* pavilion, as well as the Company's plant, was visited by a variety of delegations that included ministers of agriculture from the following countries: Azerbaijan, Vietnam, Georgia, Kazakhstan, Kirgizstan and Ukraine, a delegation of growers from Brazil and a delegation of agronomists from India. Farmers in these countries have been growing our seeds for many years.

"As for the ministers of agriculture delegations", says Yuri Pinchasov of *Zeraim Gedera*'s Marketing Department, who met with them, "special attention was given to the quality of our products. They showed interest in our vegetables varieties, which are resistant to many diseases. Due to these resistances", adds Yuri, "it's not necessary to spray plants with pesticides. This is an important health issue for those who grow and eat the plants, as well as for the environment in general".

The guests asked many questions about the level of scientific research for the breeding of new varieties. They were surprised to learn that a very high percentage of the company's profit goes to financing of scientific research. "Having said that, the prices we charge for our seeds were met with understanding. For example, the Minister of Agriculture from Georgia, Bakur Kvesereli, said that quality is crucial, therefore the price is not as important".

The Minister of Agriculture from Uzbekistan, Ermonov Farkhod, who visited our company escorted by the ambassador of Uzbekistan in Israel, Oybek Ishanov, examined the laboratories for phitopathology, treatments and packing of seeds and showed interest in the various devices and equipment.

The Brazilian delegation paid much attention to our TYLCV resistant tomato varieties, given that the disease extensively affects the crops in Brazil in the past few years.

Photo below: from left: Yuri Pinhasov , Ilham Ardabil Ogly Kuliev, Azerbijan Minister of Agriculture, Illain Sabir Oglu Majidov, Director Department of Stategic Planning of Economic Development

Minister of Agriculture of Georgia, Bakur Kvesereli (second from the left), at Zeraim Gedera's booth

Dr. Orly Mor from Zeraim Gedera with the Brazilian delegation at Zeraim Gedera's site

"My Mind Was Made Up, It Was Sugar Heart"

Woody Speir
Product Development and Sales East Coast, USA / woody.speir@zeraim.com

Accompanied by Amnon Eshet, CEO, Ofer Ben-Zvi, Head of M&S and Jose Luis Gonzalez, America's Desk Manager, we paid a visit during May, to the watermelon experimental trials, commercial production and grower/shippers in the South Florida, USA, from Arcadia to Immokalee, Florida.

Amnon Eshet and Woody Speir

The conditions faced by producers in this region were once again very challenging and affects of late cold snaps and windy conditions were evident in production. Yields were varied from farm to farm and while most were still in the full swing of harvest, they were estimated to be anywhere from 20 to 30 percent lower than average. Hollow heart was also found in a high percentage in the crown crop, which is the first fruit cut from the vine. It is common to experience this with the first cutting, as fruit that develops during the most adverse weather conditions normally suffers more and exhibits this characteristic.

Several key customers were visited during the tour and this offered a prime opportunity to see *Zeraim Gedera* varieties in harvest and hear firsthand what producers had to say about the production. Jory Corbett of Immokalee Florida is a **Sugar Heart** producer and was nearing the end of his harvest. He said that the crop had held up well and had been cut four times. Weather had been favorable and dry for weeks and this had allowed vines to hold up exceptionally well and longer than normal. Sizes were mostly 45 and 60 count and fewer 36 counts were produced. MED farms; another key customer of ours in the local area, was also one stop on the tour. Paul Sawyer of Siegers Seed Company accompanied us to the farm and led us on a tour of the packing house and through fields of MED farm **Sugar Heart** production. Robert Flint, a longtime customer of ours and a watermelon producer in Arcadia, was also harvesting and shipping his **Sugar Heart** watermelons. The crop, as was seen in Southern regions, suffered from two late cold snaps but overall was in good condition and was yielding nicely. Robert has grown **Sugar Heart** and pollinated with Patron for a number of years and is one of the best at producing watermelons consistently year in and year out. Robert is one of those growers who seem to know exactly what his crop needs, when it needs it, and where it is needed most. This is the result of a producer who is hands on and is always found near the watermelon field. "I trialed two varieties of watermelons one year", says Robert, "the first variety had hollow heart at the first cut, second cut, third cut etc. The second variety, Sugar Heart, had some hollow heart on the first cut, but then continued with solid high quality fruit. My mind was made up, it was Sugar Heart". Robert explained that he continued to learn year after year, what Sugar Heart best responded to and fine tuned his program to those needs. He likes the combination of Sugar Heart and Patron, *Zeraim Gedera*'s non-harvestable pollinator, and gets a dual use from Patron. Not only does Patron offer reliable, long season pollen availability for the triploids, it serves to protect those precious fruit from another pest, wild hogs. Robert, like many Florida producers; battles with the wild hogs and removes as many as possible by permit. According to Robert, those that remain and wander into the field, prefer the patron's non-harvestable fruit and leave his seedless watermelons untouched for the most part. Browning and Son's Jim Stewart is responsible for the movement of Robert's entire watermelon crop. Jim said the demand for 45 count watermelons was high this season and movement of the crop was steady. Robert Flint grew two of *Zeraim Gedera*'s new watermelon varieties this year called **Sugar Coat** and **SugaRed**. **Sugar Coat** is a 85 to 90 day seedless crimson type that sizes between 18 to 20 lbs, good flesh firmness and the flesh color is deep red. **SugaRed** is 80 to 85 day seedless crimson type that sizes between 15 to 18 lbs. Both varieties are being grown in commercial fields this year on a trial basis and have given excellent results. Another variety of ours, while not new, called **Crisp N Sweet**, also performed well during the Florida watermelon season. **Crisp N Sweet** is a 75 to 80 day seedless crimson type that sizes between 16 to 18 lbs.

Robert is one of those growers who seem to know exactly what his crop needs, when it needs it, and where it is needed most. This is the result of a producer who is hands on and is always found near the watermelon field.

Robert explained that he continued to learn year after year, what Sugar Heart best responded to and fine tuned his program to those needs.

Robert used *Zeraim Gedera*'s new plant program this year called "Plant Sense". This was the first year the program was launched throughout Florida and Georgia. "Plant Sense exceeded all of our first year goals and then some", said Meir Peretz, NAFTA PD Manager. A Special thanks to Siegers Seed Company, who co-launched the program with us and those dedicated plant producers who did an outstanding job of producing quality plants and offered first class service to the producers. The Plant Producers were Barnett and Partin of Felda, Florida, Mobley Plant World of Labelle, Florida and Mobley Greenhouses of Moultrie, Georgia, The Plant Farm of Sarasota, Florida,

Valdosta Plant Company of Adel, Georgia and Lewis Taylor Farms of Tifton, Georgia.

Our tour group met with James Brusca, NAFTA watermelon breeder for Syngenta. According to James, disease resistance is a high priority in Syngenta breeding program and progress is being made in areas such as powdery mildew, downy mildew, and fusarium. We were also reminded that the genome of watermelon would be sequenced by the end of this year and this, along with other data bases acquired up to this point on watermelon traits, should advance the speed at which progress is made in watermelon breeding.

Zeraim Gedera is known for its innovation and expertise in the vegetable seed business and is committed to continue to bring those products to the market that producers need to remain competitive and viable.

From left: Paul Sawyer of Siegers Seed Company, Amnon Eshet, Ofer Ben Zvi and Jose Luis Gonzalez Beristain from Zeraim Gedera

New Opportunities For *Zeraim Gedera* In Central America

Meir Peretz
Product Development Manager, NAFTA / meir.peretz@zeraim.com

I traveled to Guatemala last spring to evaluate peppers at the Popoyan facilities (Popoyan is the exclusive distributor for Syngenta seeds in Guatemala), and to monitor watermelon trials at "Ayco Farms". *Zeraim Gedera* has been trialing peppers, tomatoes and watermelons over the past two years throughout Central America.

Cannon in Guatemala

Zeraim Gedera is exploring opportunities in this market which is divided into two segments:

- Export to USA
- Europe

DOMESTIC MARKETS / We at *Zeraim Gedera* are pursuing the export segment which is a continuation to our efforts in NAFTA. The main opportunities are in seedless watermelons, indoor peppers, indoor and outdoor tomatoes and Yellow Canary melons .

In the last two years we have intensified our trialing program in the following countries:

Guatemala / peppers , tomatoes and seedless watermelons

Honduras / seedless watermelons and, peppers in the near future

Costa Rica / Yellow Canary melons and tomatoes

The approach was basic. We started working with the local distributors in these countries, who will eventually sell our products exclusively. Fernando Aranda (the region's marketing manager), and I traveled a few times to the region to support the trials and product introduction activities.

In 2008-2009 we joined efforts with the Syngenta dealer in Guatemala, Popoyan. This partnership with the Syngenta area manager Wilfredo Moran is already yielding quick gains.

GUATEMALA / Trialed in Guatemala, our **Cannon** pepper is performing well under the local conditions (similar to the higher elevation in central Mexico): high yield, good quality and large sizes .

Personal Watermelons – our newest introduction **Summer Bite**, is performing very well in the country.

A pepper greenhouse in Gautemala

HONDURAS / Most of the trials we conducted in Honduras were with watermelons. Our **Summer Bite** is performing well in the country. Like the **Summer Bite**, we had successful trials of **Sugar Heart** and **Sugar Coat** which are popular in Florida and Georgia in the USA .

COSTA RICA / We are continuing on developing more adaptable Yellow Canary melons to the growing climate with shipping abilities to arrive in Europe. In 2009 we selected five new candidates from the breeder's trials.

***SYNGENTA* INTEGRATION /** The collaboration with the *Syngenta* team in that region is bearing fruit. Our team supports the product development and the *Syngenta* team performs the sales and marketing, using their existing distribution channels in the countries mentioned above

United Fresh 2009

On April 22-24, the United Fresh Show took place in Las Vegas, USA, in conjunction with the Fresh Cut Association The two organizations, which were merged last year, put on a show with exhibitors mainly from the fruit industry: Mexico Partners, Sandstone Marketing, Sunset Produce from Mastronardi, Canada, Andrew Williamson Fresh Produce – the largest grower in Baja Mexico of Roma tomatoes and Slicer cucumbers, Lakeside Produce Mexico, Colorful Harvest, Pura Vida, Mellisa's Produce etc The show is another platform of keeping up with market trends and the Fresh Cut industry and where one can meet with important customers.

The show floor, new product displays

Breeding Environmental Friendly Pepper Varieties In Zeraim Gedera

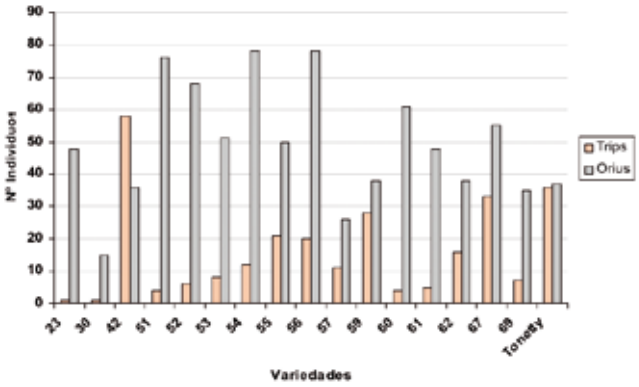
Dr. Yuval Jacobson
Pepper Breeder / yuval.jacobsohn@zeraim.com

In order to reduce the use of toxic pesticides in farming, the use of combined biological pest control is increasing and may eventually become mandatory.

Biological pest control, in fact, creates new environmental conditions for the plants. We at *Zeraim Gedera* believe (and act accordingly) that the breeding procedure must be carried out under the environmental conditions in which the variety will be grown. In our breeding fields, we make use of pest control by using natural enemies. The objective is to develop varieties "friendly" towards the natural enemies, varieties that can quickly become established on the plants. Over the past year we have begun cooperating with *Bio-Bee. At first, the differences were checked in the preference of the Orius* and the Western Flower Trips in several varieties (there are still no results). In a similar trial conducted during the previous season in Almeria in Spain by Zeraim Iberica, *Zeraim Gedera*'s subsidiary in Spain, we can see that there are several differences in the Orius and Thrips and the ratio between them and several of our blocky pepper varieties (see table). It is important to note that this is only the beginning of the work and we are not yet able to determine any recommendations pertaining to varieties, we are only able to observe the phenomenon that there are differences between them.

**Bio-Bee Biological Systems in Kibbutz Sde Eliyahu is a company which mass produces and implements beneficial insects and mites for agricultural purposes.*

The Orius laevigatus is a small predatory insect, piercing-sucking mouthparts, and two pairs of wings. Since 1991, several species of Orius are commercially used throughout the world for thrips control, especially the western flower thrips.



Biological Control – A Growing Trend In The Agricultural World

Biological control has become a cornerstone of pest management in many parts of the world in recent years. Previously, post harvest diseases did not receive the attention warranted by a problem of such magnitude. It is difficult to determine the full extent of post harvest losses caused by disease; however, conservative estimates place U.S. losses, for example, to fruits and vegetables from spoilage at around 24% of the harvested crop (source: Annu. Rev. Phytopathol. 1989. 27:425—41).

Losses are generally determined at a single point in the post harvest food pipeline and accumulated losses during transport and processing of food are seldom calculated. We fail to consider post harvest disease losses in grocery stores, restaurants, fast food outlets, and kitchens. Also, losses in the nutritional value and quality of food are generally overlooked.

Just as the post-harvest treatment, the practice of biological control, whether by insects or other substances, has successfully reduced damage from pest species in a variety of manipulated systems and biological control has great value in sustaining environmental health, particularly in reducing pesticide use. These attributes indicate that use of biological control agents will continue and even grow. However, debate is increasing on the need for greater regulatory monitoring of biological control agents.

Due to the lack of regulation in most EU member states the use of insects, mites and nematodes in plant protection is widespread in European agriculture and horticulture with an annual turnover exceeding € 150 million. However, there is growing concern about possible impact to the environment. This concern led to the establishment of national regulation by some EU member states, potentially limiting further promotion of the organisms generally used in biological control.

Andalusia Views Biological Control As Path To Further Growth

By / Steven Maxwell

Andalusia's radical move into biological pest controls over the past two seasons is set for further expansion in the region, says Andalusian agriculture minister Martin Soler.....The Andalusian province produced 3m tons of fresh produce last season, of which some 11,500ha were grown using natural pest control methods.

Mr Soler says Andalusia's fresh produce sector and specifically the province of Almeria has fully recovered from the illegal pesticides scandal that engulfed the region two years ago and is all the better for it....Andalusia produces a range of fruit and vegetables - including tomatoes, peppers, cucumbers, melons and watermelons - with production primarily concentrated in the provinces of Almeria, Granada and Malaga.

Almeria-based Hortyfruta, which was formed by a number of leading Andalusian fresh produce associations in March 2007, is aiming to lead the sector's efforts to increase exports and boost the industry's image outside Spain.

Hortyfruta managing director Maria Jose Pardo said that the organization has spent much of that period publicizing the progress of growers in Andalusia towards adopting biological pest control systems, with the principal aim of increasing the proportion of the sector using natural methods for pest control. "Three years ago we had approximately 1,500ha using biological pest controls, this increased to 12,000ha last season and this year we are forecasting that we will reach between 18,000 ha and I9,000ha."

Total production is expected to increase by as much as 4 per cent during the 2008/09 campaign compared with the previous season. In terms of exports, Hortyfruta's managing director believes that shipments could reach 1.28m tons, a figure which, if achieved, would mark a 2 per cent increase on previous campaign's 1.26m tons. This steady growth could be regarded as especially impressive given that the sector also achieved a 2.3 per cent increase during the 2007/08 campaign over the 12 months before. During the 2007/08 season, growers in Andalusia produced an estimated 776,000 tons of tomatoes, 573,327 tons of cucumbers, 456,000 tons of peppers...and 221,934 tons of watermelons among other crops.

Germany, France, the Netherlands and the UK, as well as to a lesser extent Poland and Italy, were the principal export markets for both Almeria and Andalusia as a whole during the campaign, according to Hortyfruta.

*This article originally appeared in the Trade Spain 2009 supplement, published by Eurofruit Magazine

Zeraim Gedera Is Expanding Its Service Basket to Its Customers

The Company has reinforced its agro-technical service team with the objective of assisting farmers to increase their productivity from the crops grown from varieties it breeds.

The program consists of a number of agronomists who provide agro-technical services for growers, to help them increase productivity from their crops.

As one of the leading vegetable seed breeders worldwide, *Zeraim Gedera* sees the growers as key partners in setting and maintaining the Company's position. When the global economic crisis which harms, among other things, the fresh produce market in Israel and abroad broke out, *Zeraim Gedera* decided to come to the aid of the farmers by setting up its ZAAP – Zeraim Agro-technical Assistant Program. The program consists of a number of agronomists who provide agro-technical services for growers, to help them increase productivity from their crops.

"Our vision", explains Yoel Messika, manager of the Company's Agro-technical and Guidance Unit, "is to provide the growers with agro-technical assistance, help them throughout the growing period, provide them with agronomical solutions for our varieties, develop growing protocols for our selected commercial varieties, which will provide the growers with "operating instructions" for planting and growing". Furthermore, the ZAAP team will produce professional publications and hold courses on these topics for the benefit of the farmers, throughout the world.

Yoel will focus on the subject of plant protection, while Zvi Wener will deal will the topic of irrigation and fertilization. Asher Kalinsky is an expert in agro-technology and climate control and will focus on these topics.

ZAAP at your service

The services will be provided to growers in Israel, Mexico & Turkey, three strategic marekts, where the Company's vegetable varieties are grown. Global trends as well as the changes in the consumer culture of the Western world requires that the breeders and the growers be ready in order to minimize the economic damage. vThe objective of the close agro-technical support is to help the farmers streamline their farms and increase productivity in order to improve competitiveness in the markets in which they operate.

PLANT PROTECTION GUIDELINES ▪ For The Coming Summer Season For Growers Of Greenhouse Tomatoes

Yoel Messika
Manager, Agro-Technical and Guidance Unit / yoel.messika@zeraim.com

As summer approaches we see an increase in the number of pests such as leaf miners, mites (Red spider mitesand Tomato russet mites), whitefly and various, caterpillars. Shadehouses planted in the spring, with developed foliage are liable to be attacked by leaf and soil diseases (Bacterial wilt and Verticillium Wilt in tomatoes). At the same time it is important to continue preventative treatment against leaf diseases by using one of the preventative solutions such as sulfur compounds for powdery mildew diseases and manganese compounds to prevent the development of Late blightearly blightand leaf mold.

DISEASES

Powdery Mildew (Erysiphe spp / Leveillula taurica) / This disease is very active during the spring/summer season. It first develops (primarily) in the lower older leaves and later rises to the upper leaves. In addition, in recent years, more and more tomato plants have been found to be infected with Erysiphe spp as opposed to Leveillula taurica (which appears as yellow spots on the upper side of the leaves while on the under side it appears as white spots which hold the fungus spores). With Erysiphe spp white spots (fungus mycelium and spores) appear on the upper side of the leaves. It is imperative to prevent the development of the disease by removing infected leaves when infection is low and spraying regularly once a week with various groups of fungicides, switching between fungicides from different groups in order to prevent the development of resistance and to retain the effectiveness of existing substances.
The various groups include liquid sulfur-based substances which efficiently eliminate also,russet mite;the triazol group (pencon azole,difenconazole,triadimenol,bromuconazole,cyproconazole, ,tebuconazole,myclobutanil); the strobilurin group (azoxystrobin trifloxystrobin) and the new designated groups (cyflufenamid,boscal id+pyraclostrobin, ,bacillus subtilis neem oil).

Early Blight (Alternaria solani) / This disease primarily appears on the older leaves of the plant or on leaves with severe leaf miner infestation where the disease develops on the lesions. In such cases, effective treatment against leaf miners and against the disease is recommended. Treatment may be effective with substances such as:, difenconazole, tebuconazole, bromuconazole Mancozeb products,chlorothlonil.

Verticillium Wilt (Verticillium dahlia) / This disease attacks the entire tomato plant as it breaks down resistance to other Verticillium species which are prevalent among most tomato varieties. It is important to remember that there is currently no source of resistance to this disease in commercial varieties and the process of introducing resistance will take time , therefore the key method for dealing with this disease is chemical treatment of the soil. From the experience gained so far we can say that sterilization with methyl bromide is very effective in eliminating the pathogen of this disease. Without this option, it is possible to treat the soil with metham sodium substances combined with solar sterilization (for a minimum of one month) to achieve effective sterilization. The symptoms of the disease are drying of the bottom leaves of the plant and if the stem is cut, dark, discoloration may be seen in the plant's veins. Growers who suspect that the disease has appeared in one of their plots are required to inform us so that we can conduct laboratory tests to verify the disease (Fig. 1 – Symptoms of Verticillium Wilt of tomato).

It is inportant to control Thrips population by pesticides application such as abamectin abamectins Spinosad, emamectin benzoate.

TSWV in a tomato plant

Bacterial Wilt (Clavibacter Michiganense) / Clavibacter michiganense is a serious threat to tomato crops in Israel and worldwide. Should a plant be suspected of being contaminated with the disease, we recommend that the grower inform us so that we can verify such suspicion. The disease pathogen is a bacteria that spreads through the plant's vascular system and harms all parts of the plant. Lesions first appear on the leaves of contaminated plants (see Fig. 2) and later, brownish streaks appear along the stems. These streaks crack open and rot sets into the vascular system. The top of the plant wilts. The leaves develop typical symptoms: Half the leaf wilts while the other half remains vital for a longer time. When the leaf is broken off, typical horseshoe shape discoloration is found at its base (see Fig. 3). Finally, the entire plant wilts. Under dry conditions, the bacteria's survival rate is high. The bacteria is liable to remain in the soil and on solanaceous cultivars, such as peppers and eggplant, and weeds.

Plants can become infected by way of two primary methods:

- Planting in contaminated plots. The disease pathogen accumulates in the soil and when the level is sufficiently high, the plants become infected. In crops grown in soilless substrate, the water flow may carry and spread the disease.

It is inportant to control whitefly population by pesticides application especially during the first month of growth, of 1-3 treatments per week, followed by once every week/ two weeks (according to the infestation and age of the plant) and to switch between the different groups of pesticides in order to prevent loss the resistance of the varieties and generation of large populations of whitefly which are resistant to pesticides.

- The disease is primarily spread by transmission of the disease from the foliage of contaminated plots through mechanical damage to plants caused by agro-technical operations of workers such as pinching of (shotse) plants, twisting of stems and removal of bottom leaves, whereby in most cases no symptoms of the disease are visible on the plants.

How can plant contamination with the disease pathogen be prevented?

A / Monitor suspect plants (yellowing or wilting plants). Clearly mark the suspect plants and do not touch them, unless at the end of the work day (in order not to infect healthy plants). In plots with isolated contaminated plants, they should be removed from the plot and destroyed (uproot the plant and place it into a plastic bag in order not to spread infected parts throughout the plot).

B / A contaminated area or plot should be treated separately. A separate team of workers should be formed for the contaminated plots. Work in suspect plots should be carried out only at the end of the work day, and in any event, work on plants in structures should be carried out using disposable gloves and special cutters or knives designated for use in said structure, and which are not used in other structures.

C / Prevent the entry of visitors into healthy or contaminated plots. Equipment for sterilizing shoes should be placed at the entrance to each structure – a tray with a flat sponge soaked in 2% solution of Sodium Hypochlorite , commonly known as bleach or similar solutions).

D / Sterilization of tools with 2% bleach solution.

E / Avoid using used packaging materials, do not move picking containers from contaminated plots to healthy plots. When using plastic picking containers, they should be rinsed or treated with 2% active chloride solution.

PESTS

Western Flower Thrips (Frankliniella occdentalis) / This pest is becoming dominant in tomatoes and has recently been observed in several tomato plots covered with 50 mesh insect nets in various regions in Israel and worldwide. TSWV damage which is transmitted by this pest has also been observed (see Fig. 4.). Most of the damage can be seen in the spring when the population of thrips in nature is high, however since the population becomes established inside a greenhouse, the activity of the thrips is liable to continue in the summer as well. *Zeraim Gedera* has several varieties with TSWV resistant which maintain generally accepted agro-technical qualities such as **Tovi Cala** and **Baron**. In any case it is inportant to control Thrips population by pesticides application such as abamectin abamectins Spinosad, emamectin benzoate.

Whitefly(Bemisia tabaci) / Large populations of this pest are found in israel from July until the end of October. It is considered an extremely problematic pest due to the blackening damage to fruit and because it is a vector of various viruses such as TYLCV and other, geminivirus group. Today, *Zeraim Gedera* has several greenhouse varieties with

Verticillium Wilt disease in a tomato plant

TYLCV resistant which maintain generally accepted agro-technical qualities, the most prominent being **Tovi Star**, **Allegro**, **Linda**, and **Tovi Cala**. in any case, it is inportant to control whitefly population by pesticides application especially during the first month of growth, of 1-3 treatments per week, followed by once every week/two weeks (according to the infestation and age of the plant) and to switch between the different groups of pesticides in order to prevent loss the resistance of the varieties and generation of large populations of whitefly which are resistant to pesticides. Group 1: Nicotine derivatives (imidacloprid, acetamiprid, thiamethoxam, thiacloprid,dinotefuran) Group 2: diafenthiuron. Group 3: thiocycllam hydrogen oxalate (caution: do not use more than twice as it may burn). Group 4: azadirachtin, pyrethrins +neem oil (effective only for caterpillars)

Spider Mites (Tetranychus urticae) and Tomato Russet Mites (Aculops lycopersici) / The mites can first be found in the areas closest to the nets. Early detection prevents unnecessary spraying. It is recommended to spray against adult mites in response to initial appearance with one of the following groups of pesticides, which are effective against both types of mites, in rotation: abamectin, spiromesifen, pyrimidifen. The pesticides: tebufenpyrad, amitraz, azocyclotin, ,bifenazate, are effective against spider mites. The pesticides: etoxazole, clofentezine, effectively control only the eggs of spider mite, and it is recommended to combine it with pesticides that are effective against adult mites.

Leaf Miner (Liriomyza trifolii) / This pest is very active in israel during the spring and can cause much damage (see section on early blight). Should this pest appear, it can be treated with one of the following pesticides: Abamectin, thiocycllam hydrogen oxalate (caution: do not use more than twice as it may burn), cyromazine, Spinosad (also effective against small caterpillars and thrips).

Important notice: Before every application carefully check that the pesticide is registered for the crop. If the crop is designated for export, it is imperative to check with the marketing company whether the pesticide is permitted, the duration of the waiting period prior to harvest and whether it is permitted to mix the pesticide with other substances or with natural predators in the greenhouse. The advice given in this pamphlet has been prepared with the utmost care. However local circumstances and conditions greatly affect the final results of a crop. Therefore, Zeraim Gedera cannot accept any responsibility for the outcome of a crop.

THE USE OF **SHADING**

In Summer Crops of Tomatoes & Peppers

Zvi Howard Wener
Chief Agronomist, Agro-Technical and Guidance Unit / zvi_howard.wener@zeraim.com

In Mediterranean climates we plant tomatoes and peppers almost all year round. In spring and especially in summer there are very high temperatures with very high amounts of light radiation. These conditions can create a great amount of stress on both seedlings and plants resulting in lower yields. Shading methods have been developed over the years to allow the plants to grow under better conditions and thereby improve the quality and yields of the crops.

Tomato trials in colored nets

Commercial grown peppers under a pearl colored net

Multicolored net

SHADE NET

Advantages / Black net is cheaper, easier to maintain and operate as compared to 50 mesh net.
It is less humid under netting as compared to 50 mesh net. The air flows more freely, air temperatures are lower as are leaf/plant temperatures. and overall it is easier to create a better environment for the plant growth.

The shade percentage remains more stable than 50 mesh nets because the dust that adheres to the net does not increase the shade percentage because the net is black.
Netting prevents the penetration of pests such as Heliothis, Prodenia, Laphygma, Plusia amd Agrotis.

Provides protection against hail and reduces damage from radiation frost, sun burn and wind compared with plots grown without protective net.

Disadvantages / A range of pests are able to penetrate the net such as; tobacco whitefly, aphides, western flower thrips, mites and leaf borer flies. Some of these pests are vectors of diseases and viruses and may cause much damage to the crop.
Suitable for spring/summer crops and not suitable for autumn/winter crops, since these nets are not able to accumulate the heat required in the structure for the development of the plants in autumn/winter.

50 MESH NET

Advantages / Provides effective protection against most pepper and tomato pests, including tobacco whitefly, aphides, borer flies, moths and significantly reduces penetration of thrips and mites, compared with shade netting.
When the net is clean it provides 25-35% shade.
Provides protection against hail and reduces damage from radiation frost, sun burn and wind compared with plots grown without protective net and shade netting.
Suitable for late summer plantings and is better in autumn/winter than shade netting as these nets are able to accumulate heat better than shade netting.

Disadvantages / Air flow within the structure covered with 50 mesh nets is relatively poor resulting in relative increase in humidity in the structure. This makes it more difficult for the plant to lower the temperature around it (which is based on the photorespiration process). In addition, the risk increases for the development of leaf diseases, which develop well in relatively high humidity conditions.
Heavy heat load in summer is liable to cause faulty fruit setting.

These nets tend to collect dust over the course of their life, resulting in rising shade percentage, which may reach up to 50% shade. This is not

Growing tomatoes under a black net using Spanish trellising

Growing tomatoes under a black net using Dutch trellising

desirable during the autumn/winter season, when the radiation is low and is required for the growth of the plant.

LIGHT

The light used in photosynthesis is called PAR (photoactive radiation) and it is measured in units of micro-Einstein. There are light meters available to measure the PAR light.

Tomatoes give good yields and quality when the PAR is 405-700 micro-Einsteins, whereas peppers require between 800-1200 micro-Einsteins for optimal photosynthesis.

If on a summer's day the light radiation is 2000 micro-Einsteins then if there is 30% shading there is enough light for most of the day for both tomatoes and peppers.

The grower of tomatoes and peppers wants to have as many daylight hours as possible within the micro-Einstein ranges mentioned above. When light levels are below the optimal levels mentioned above then the photosynthetic rate decreases and the yield and quality will suffer.

Black shade net of 30% will give many hours a day of good sunlight for photosynthesis and also provide the physical protection as listed above.

Tomatoes under Black Net / If the structure is strong enough to support the crop then Dutch trellising can be used. With Dutch trellising, double rows can be used with normal plant spacing of 40-50cm. Single rows can also be used with plant spacing of 30-40cm and the rows spaced 110-150cm.

Spanish trellising can be used in all structures of black net. In Spanish trellising single rows are used. The distance between plants in the row can be between 30-40cm and the distance between rows is 110-150cm. The plants are usually grown on single stems but can also be grown on double stems. The heads are cut when the plants reach the top of the stakes.

White fly can easily enter any net-house that is not covered with 50 mesh anti-insect net. Therefore, if the disease TYLCV (Tomato Yellow Leaf Curly Virus) is found in the growing area then only grow varieties with good tolerance to the disease.

Peppers under Black Net / If the structure is strong enough to support the crop then Dutch trellising can be used. Double rows are used with plant spacing within the rows at 30-40cm.

Spanish trellising can be used in all structures of black net.

In Spanish trellising single rows are used. Spacing is 30-40cm within the row and 110-150cm from row to row.

NEW COLORED NETS

The colored nets help manage the light spectrum and have special optic properties enabling exploitation of the sun's rays.

For example: three shade net structures for pepper crops with the same 30% shade were compared. The colors of the nets were red, black and pearl. The results achieved were that the pearl nets provided better protection against diseases and viruses compared with the other nets tested. Nonetheless, the plants grown under the red shade netting attained higher yields than the other nets.

researchers TALK

The Effect Of The Ambient Conditions Between Harvest To Storage On The Quality Of Cherry Tomatoes

By: Dr. Amnon Lichter, Anna Danshin and Orit Dvir / *Dept. of Postharvest Science, The Volcani Center, Bet Dagan POB 6 ZIP 50250, Israel*

ABSTRACT

It is a common practice in Israel to hold cherry tomatoes under ambient conditions prior to cold storage in order to reduce the damage from fruit cracking after harvest. Fruit cracking is caused primarily from internal pressure on the fruit peel and holding it in the ambient conditions provides time for susceptible fruit to crack or to lose water thereby reducing the risk of cracking. However, the ambient conditions under which the fruit are held varies in different regions of the country and during the season, raising doubts regarding the effectiveness of this practice. In this study, cherry tomatoes were kept for 24 to 48 hours at variable humidity and temperature ranging between 6 to 25^{O}C and 34% to 95% relative humidity. The fruit were tested for weight loss, color, firmness and potential cracking. The findings show that under conditions where water loss was high, the cracking potential was low and under conditions where water loss was low, the risk of cracking increased. According to the results, it appears that water loss of about 1% prior to cold storage may reduce the potential fruit cracking.

INTRODUCTION

The practice of holding cherry tomatoes at ambient conditions prior to cold storage was adopted by tomato growers in order to cope with the problem of postharvest cracking of the fruit. According to this practice, fruit is stored at ambient conditions for one to two days after harvest followed by sorting, packing and cold storage. If the fruit has to be washed, it may be washed either immediately after harvest or after one day of storage at ambient conditions. The conditions for holding fruit were not defined and each grower keeps the fruit under ambient conditions that may vary drastically during the season. Although this

continuance > The Effect Of The Ambient Conditions Between Harvest To Storage On The Quality Of Cherry Tomatoes

practice does not eliminate the problems fruit cracking, it is believed to reduce the risk and it is widely applied. However, when the demand from exporters for fruit is high, many farmers may skip this stage.

Temperature and humidity are the most significant environmental factors that affect the postharvest quality of fruit (Paul, 1999). The adverse affects of low humidity or high temperatures can be similar and it is possible to use one term, WVPD, to describe both factors. WVPD is the vapor pressure difference between saturation and the actual conditions. For example, when the WVPD is close to zero, the vapor pressure between the fruit and the environment is minimal and water loss from the fruit is minimal. By contrast, when the WVPD is high, water loss from the fruit will be high. The significance of the WVPD concept is emphasized by the fact that it can predict the weight loss from the fruit in a linear manner. For example at WVPD of 0.4 KPa the weight loss can be predicted to be double then if the WVPD is 0.2 Kpa.
The objective of this study was to examine the effect of this transient storage at ambient conditions on the postharvest quality of cherry tomatoes.

METHODS

Natacha cherry tomatoes (*Zeraim Gedera* variety) was received from the Naftali family in Moshav Noga, Israel. The fruit was picked in the morning of the experiment and sorted according to size on the farmer's sorting machine. The fruit was packed and weighed in 400 gm punnets, in two layers without sorting for color and in 5 replications per treatment. Samples of fruit were taken for measurement of color, firmness and cracking. The fruit was stored under various conditions as specified in Table 1, for 24 or 48 hours and later at 12oC and 95% relative humidity (RH) for a further period of 10 days followed by two days at 19oC and RH of 85%.

Firmness was measured on a sample of 20 fruit by compression (FirmtechII, BioWorks, USA) and results are presented in units of gm/mm. Color was determined in units of hew angel (ho) as measured by a Minolta Chromameter. Cracking potential was determined by soaking 15 fruit in tap water for 16 hours and counting the number of cracked fruit (Lichter et al., 2002).
Humidity and temperature were monitored with Rotronic data loggers (Madid, Haifa, Israel). Water vapor pressure deficit (WVPD) values were calculated according to Campbell and Norman (1997).
The results presented in Fig. 1 are a combination of the results of two separate experiments conducted in December and in January and the results presented in Fig. 2 refer to an experiment conducted in January.

RESULTS AND DISCUSSION

The conditions at which the fruit were held after harvest are described in Table 1 (RH and temperatures expressed and the calculated WVPD). The results in Fig. 1A indicates high correlation between the WVPD values and the weight loss from the fruit. The fact that the slope of the line for 48 hours is almost double then the slope of the line for 24 hours indicates that at 48 hours, there was no decline in the rate of weight loss due to an increase in osmotic pressure in the fruit. These lines enable us to predict the weight loss at any given conditions even if not tested directly. Under common ambient conditions (19oC, low humidity, the weight loss was approximately 1% per day. However at high RH and similar temperature, weight loss dropped to half of this value. Low temperature compensated for the low RH resulting in low weight loss.
After 48 hours the fruit was transferred to storage at 12oC for 10 days followed by two days at 20oC. The final weight loss of the fruit did not differ among the treatments except when fruits were exposed for 25oC for 48 hours.

The potential cracking of fruit was measured by soaking the fruit in water after the 48 hours period under the various conditions. The results presented in Fig. 1B indicate low correlation between the WVPD and the percentage of cracked fruit. However under conditions that generates high WVPD, the percentage of cracked fruit is low while under conditions of low WVPD the potential cracking increased. According to these results, the optimal conditions that will reduce cracking are a compromise between high and low WVPD. These results are compromised to some extent by the fact that the fruit used in the study were a mixture ripening stages and it is known that riper fruits have higher susceptibility to cracking.
From the measurement of fruit firmness after 48 hours of incubation (Fig. 1C) we can see the negative correlation between the WVPD and fruit firmness. This result is logical because during this short period it is expected that the primary cause for loss of firmness will be water loss rather than ripening. The adverse affect of extremely high WVPD (25oC) is also discernable at the end of storage.
As expected, the correlation between fruit color and WVPD was rather low (R2=0.67). By contrast, the correlation between fruit color and temperature was high (Fig. 2). Exposure of the fruit to a temperature of 25°C for 48 hours after harvest resulted in a negative effect on color development as well as the negative effects on weight loss and firmness as mentioned earlier.

CONCLUSIONS

From the general point of view, loss of weight in agricultural produce is negative since in most cases it is linked to a decline in the quality of the product which can be expressed in loss of firmness, shriveling and related disorders. In the case of cherry tomatoes, the role of transient storage at ambient conditions is to provide time for the fruit to crack and to reduce the cracking potential of the fruit. The results of the study show that keeping the fruits at high humidity or low temperature will reduce the weight loss. In contrast holding the fruit at 25^{o}C, a temperature that is not considered extreme in the Mediterranean region, may cause significant adverse affects on the quality of the fruit.

The cracking potential of the fruit is not simple to predict. We used a functional test developed by us several years ago, whereby cherry tomatoes are soaked in water and the percentage of fruit cracked due to the treatment is examined (Lichter et al, 2002). According to our current understanding, it appears that a WVPD range of 0.5 to 1 KPa is the range in which the fruit loses approximately 1% of its weight during a period of 24 hours. Many growers do not have controllable conditions to keep the fruits between harvest and storage. Those growers can easily monitor weight loss under their specific conditions. Therefore the growers can reduce the risk of fruit cracking by allowing the fruit sufficient weight loss time that will reduce the risk of fruit cracking.

Table 1 / Experimental conditions, calculated WVPD values and weight loss of cherry tomatoes after 24 or 48 hours of incubation:

T (°C)	RH (%)	WVPD (Kpa)	Weight loss (%)	
			24 h	48 h
6.3	40	0.571	1.03	1.38
6.3	34	0.632	0.63	1.05
11.7	95	0.062	0.29	0.48
12.2	93	0.094	0.64	0.80
14.4	71	0.475	0.60	0.70
18.8	63	0.807	1.11	2.28
19.1	55	0.987	1.00	1.84
19.3	74	0.577	1.02	2.15
19.4	64	0.809	1.16	2.05
19.5	85	0.337	0.46	0.87
25.2	55	1.425	2.20	3.95
25.4	43	1.844	2.47	5.30

Fig. 1. Affect of WVPD on weight loss (A); cracking (B) and firmness (C) of cherry tomatoes The cracking and firmness results refer to values measured after 48 hours of exposure to the different conditions WVPD values were according to the data in Table 1.

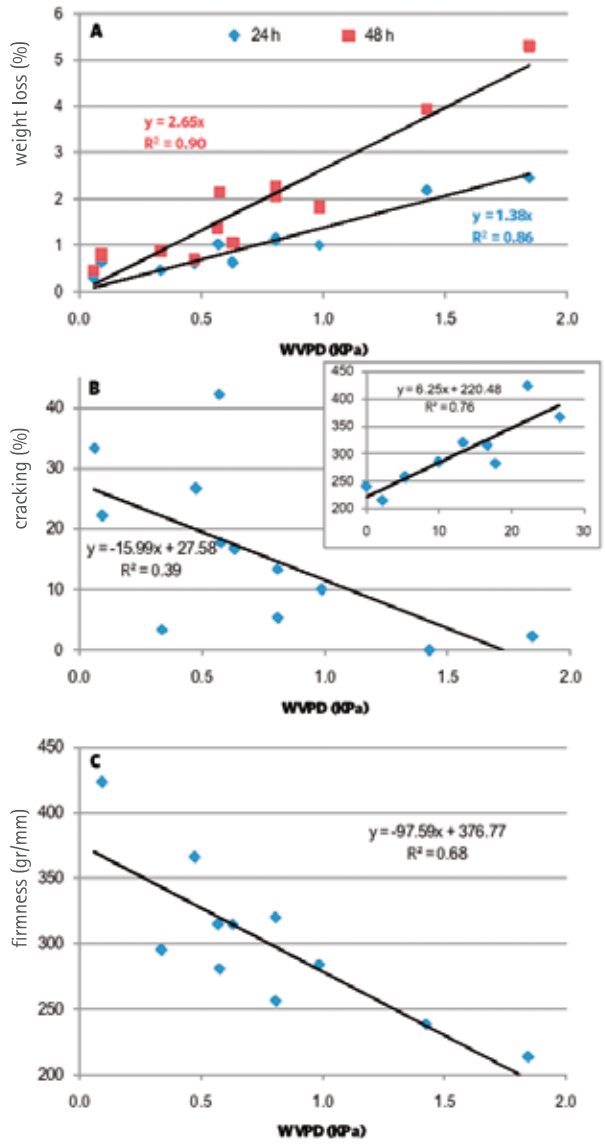
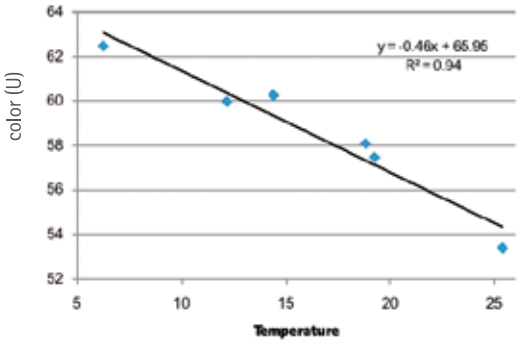


Fig. 2. The effect of temperature on fruit color measured after 48 hours of incubation at the different conditions. The color unit is the 'angel' of the color (h° value).



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Alegro new

- High tolerance to TYLCV
- Very shiny red color
- Very vigorous plant
- Excellent firmness

Weight (gr)	Diameter (mm)	Shape & Color	Shoulders	Resistance
160-180	60-70		Uniform	V, Fol 1, Fol 2, ToMV, M (IR), For, TYLCV (IR)
Cultivation	Trellising	Cycle	Maturity	Planting Season
Indoor	Trellising	Medium/ Long	Medium	AU

Tovi Star

- High tolerance to TYLCV
- Field tolerance to leaf diseases and bacteria
- Very vigorous plant
- Excellent shelf-life
- Excellent firmness
- Deep red color

Weight (gr)	Diameter (mm)	Shape & Color	Shoulders	Resistance
190-210	70-80		Uniform	V, Fol 1, Fol 2, ToMV, M (IR), For, TYLCV (IR)
Cultivation	Trellising	Cycle	Maturity	Planting Season
Indoor, outdoor	Trellising	Medium	Medium	Early AU, early SU

Katalina

- Very vigorous plant
- Excellent firmness
- High yield
- Very long shelf-life
- Very good setting under low temperatures

Weight (gr)	Diameter (mm)	Shape & Color	Shoulders	Resistance
8-12	24-30		Light green	Fol 1, ToMV, M (IR), Ff 5
Cultivation	Trellising	Cycle	Maturity	Planting Season
Nethouse, greenhouse	Trellising	Long	Medium	SP, SU, Early AU, AU, WI

Godzila

TSWV Tolerant and TM Resistance

- Very vigorous plant
- Very thick fruit walls
- Excellent shiny fruit color
- Grower friendly, extended planting seasons
- Good setting under high temperatures

Weight (gr)	Diameter (mm)	Shape & Color	Cultivation	Trellising
200-250	100-130		Nethouse/ Greenhouse	Dutch/ spanish
Planting Season	Growing Season		Maturity	Resistance
Main season	AU, WI		Medium	Tm 3, TSWV (IR)

THE MAIN PRINCIPLES AND FACTORS THAT INFLUENCE FLAVOR AND AROMA IN TOMATOES

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Throughout the past decades, numerous investigators have set out to identify the compounds of flavor and aroma in fruits and vegetables. This article will present some of the factors regarding that issue.

Photosynthetic Factors

- It is recommended to maintain high levels of PAR radiation, between 600–1800 micro-Einsteins (µmol m-2 s-1) for at least 8 hours. Low radiation values and shade can be detrimental to taste and flavor.
- During the growth and ripening of fruits, the night temperatures should not be higher than 22^{O}C and the day temperatures should not be over 35^{O}C.
- Always leave one leaf below the cluster that is to be harvested Do not remove leaves in order to accelerate the ripening of fruits. The practice of removing leaves is purely for sanitary purposes.
- The above points provide the plants with a positive photosynthetic balance, which means that there will be more "free assimilates" in the fruit, seeds and gel.

Irrigation and Nutritional Factors

- There is a mistaken belief that the Brix increases when the amount of irrigation is reduced in order to concentrate the intracellular solutions. Water stress produces two negative effects:
  (1) The photosynthetic efficiency is reduced (weight of dry matter) by 30% because of the partial or total closing of the stomata.
  (2) There is reduced assimilate translocation to growing tissue and fruits.
- Therefore, it is recommended not to reduce the normal irrigation. The osmotic balance of the nutritious solutions in the plant can be controlled by varying the fertigation EC. Higher and lower EC levels will increase or decrease the concentration of the cellular juices.

Consider the following points

- Reduced root volume makes it difficult for a plant to adjust to new EC levels and the plant is then more vulnerable to nutritional stress and then deficiencies.
- The substrate volume for the roots of a tomato plant should be at least 7 liters/plant.
- Minimum drainage in soilless conditions should be at least 20%.
- The percentage of drainage should be constant during the irrigations throughout the day and not be just the average for a day. The relationship between the irrigation quantity and the drainage should be an analogical parameter such as the solar irradiation or the evapo-transpiration rate during the day.
- Maximum water intake of the plant occurs at the same hours of maximum nutrient absorption and photosynthetic efficiency. It is recommended that these factors not be allowed to be limiting factors.

Recommendations

- The irrigation and fertilization during the first stage of the culture will be "normal" until the fruit set of the third cluster. "Normal" means that the amount of pure N injected to the substrate will be 4000g/ha/day.
- The EC should not be more than 3.5 dS/m in the solution of the drainage or the extractor.
- As the plants develop and bear fruit, we proportionately increase the EC in the soil solution or substrate to achieve higher EC values of 6 dS/m during the picking period.
- Approximately 6 weeks before the end of the crop cycle it is recommended to reduce the osmotic tension in the saline soil solution. This will help lengthen the crop life and maintain fruit size. If the EC levels are too high then the crop life will be shortened and fruit size will become smaller.

Table of Values Obtained from Measurements in a Demonstration Plot in Israel:
(Zeraim Gedera-Asulin Demonstration Plots – Mivatchim – 2007/8)
The EC was controlled by the addition of KCl and KNO3 to the stock solution.
Ration maintained was N: K in 1:2.5.

Stage	N (gr./ha/day)	EC (soil extractor)
Transplanting to 1st to cluster (flowers)	1000 - 2000	Until - 2
1st to cluster to setting of 3th	2000 - 4000	Until - 3
3th to cluster to pink-turning	4000 - 6000	4.5 to 6
Picking period	6000	6
Final 30 days	3000	3.5 - 4

*** The advice given in this pamphlet has been prepared with the utmost care. However local circumstances and conditions greatly affect the final results of a crop. Therefore, *Zeraim Gedera* cannot accept any responsibility for the outcome of a crop.**

*Chef Ben Buchwaic's Pepper Salad**

Ingredients for salad >
• Peppers – in three colors • Curled cucumber strips • Radish sprouts

Ingredients for Pepper Souce >
• 1 kilo peppers • 1 cup Olive Oil • Salt • Pepper • Pinch of Safron • 1/4 cup Natural Vinegar

Method >
Roast peppers in moderate-hot oven until skins are almost burned. Cool peppers, then peel and clean peppers. Chop all the ingredients and slowly add olive oil until attaining the desired thickness.

Bon Appetite!

*** The recipe is from his diverse and tasty salad bar for our guests at Zeraim Gedera's booth at Agritech**
Many thanks to Chef Buchwaic's outstanding team: Omri Mangal, Jonah Maoz, Eyal Lipschitz and Gidi Wagschul