



# The Partnership

news and views from Enza Zaden



no. 7

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Organic in the US

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in tomato

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g(r)o(w)ing strong

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## On the move

Welcome to this new edition of The Partnership.

Enza Zaden keeps performing strong on its developments of new seed varieties and sales to our customers worldwide. At the same time we see a strong growth in sharing our new technical developments with a growing group of other companies. Enza Zaden believes that cooperation in the seed business will make our sector stronger and will eventually lead to better products for growers and consumers.

Enza Zaden's strong performance creates a solid base for the future. In order to facilitate our future growth we are going to make substantial investments the coming years. Investments expanding our worldwide operational and research capacity, so we can continue to deliver to you the best genetics in high quality seeds. At the same time we continue to develop the organisation through our own tailor-made educational programmes within the Enza Academy.

We believe in value creation through cooperation; within our company but also with our suppliers, distributors and partners in the chain. All with the same end goal: to deliver consumers healthy and tasty vegetables.

Together with our partners through the combination of new genetics and innovative marketing we want to reach out to these millions of consumers and create value in life and living.

We wish you a healthy and fruitful 2015.

Jaap Mazereeuw  
Managing Director  
Enza Zaden



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# Diversification in tomato

When we think of which vegetable is firmly on the map all over the world the first one that comes to mind is tomato. Why is that? For a start, they are both very versatile products, especially tomatoes. "Tomatoes offer us so many options," says Crop Research Director for Tomato Kees Könst. "And that diversification is only increasing."

There are tomatoes of many different shapes, sizes and even flavours. Each region has its own preferences. In Eastern Europe, Russia and Central Asia, for example, beef tomatoes are very popular. The same holds for South America, where 'Chonto', or Santa Clara, is also consumed on a large scale. In South-American countries such as Brazil, Argentina and Mexico, consumers like plum and beef tomatoes, while those in Japan and Korea tend to go for cherry tomatoes and pink beef tomatoes. This is all generally speaking, because there are also major differences in flavour, use, appearance and cultivation methods.

## Local understanding

Könst: "Diversification is becoming ever more important. Global prosperity is increasing, so people have more money to spend. Consumers are consequently becoming more critical, and demand tasty food. Tasty food that is also of high quality, if only because they are spending less and less time on preparing it themselves. This is evident from, for instance, the growing demand for traditional – tastier – types of tomato, such as pink tomatoes in Turkey, Central Asia and Eastern Europe, and local types in Italy and France like coeur de boeuf tomatoes."

All these regional differences call for a lot of local understanding on the part of breeders. Regional subsidiaries all around the world and local partners with close knowledge of the market and direct contacts with customers are essential for understanding the chain's requirements. Könst: "I travel a lot for my work. I then visit various supermarkets to see what the products sold there look like, and how they are presented to consumers on the shelves. I also visit people at home. That really gives me a good impression of how the products are used in local cuisine, what requirements they must meet and what could be changed or improved. In Turkey, for example, tomatoes are cut into cubes. So this country wants tomatoes with an optimum red internal colour. Italians cook pasta with tomatoes almost every day, usually cherry tomatoes that are sautéed along with olive oil and garlic. Or they eat them raw, say stuffed with tuna, or they alternately layer slices of coeur de boeuf with slices of mozzarella. We must then ensure that the flavour and texture of the variety concerned combine excellently with the mozzarella."







*Kees Könst in conversation with visitors of BC Hot House & Costco Wholesale from Canada in the Enza Zaden tomato greenhouse in Almería, Spain.*



Consultative partners and co-creation

Regional chain parties play an important part in product development. Growers, retailers and shippers are invaluable. Shippers, for example, receive tomatoes from various growers and then decide with which varieties they want to proceed along the chain. So if there is one party with a good understanding of what the local market has to offer it’s them. Diversification involves a lot more than colour alone. Also important are quality, shape and how taste is experienced. That’s why shippers play such a pivotal role in introducing distinctiveness further along the chain.

This cooperation with consultative partners fosters co-creation. Könst: “Together with our local partners we develop new product concepts on the basis of the chain’s requirements, for example specially selected varieties that are to be sold under a registered brand name. Together we analyse the chain’s demand, create an optimum product and, in some cases, develop a logo and packaging. The varieties sold under that brand will then offer the buyers supplies of a constant good quality all the year round. This creates confidence in the chain. And that has major advantages: the brand awareness makes it easier for the growers to sell their products and they acquire a good reputation, people are more prepared to pay higher prices for the products and, above all, such brands will be strong enough to survive any crisis that may affect the sector. On top of all that, the chain can rely on products of the same high quality at all times. This holds for traders and retailers, and ultimately consumers too. With this constant high quality we create consumer loyalty. A good example is TomAzur®. In this case a strong brand offers the various chain parties certainty. This is very important, and proves to be especially successful in western markets such as Europe and North America.”

Future

What may we expect the future to bring as far as this crop is concerned? First of all, the trend that has started will continue. Branding will become ever more important and diversification, in all aspects of the product, will increase. Something else that Könst points out is that consumers will have less and less time to spend in the kitchen as they get busier and busier. So convenience products such as bags of pre-processed or ready-to-eat tomatoes will probably become increasingly popular.

But there is one aspect that is of decisive importance in branding, diversification and the trend of convenience products alike, and that is quality. The tomatoes’ quality must be of a constantly high level, even in bulk production. This is probably the reason for the shift that seems to be taking place from outdoor cultivation to cultivation in which the plants and their fruits are protected with nets or plastic. This is becoming quite common especially in Mexico, Chile and a few other South American countries. Könst: “Developments like this are intensifying the exchange of expertise, data and breeding material between our R&D stations all around the world, which all have their own specialisations. That leads to surprising new lines and increasingly flexible varieties, enabling us all to rise to a higher level together.” ■

Challenges

Various requirements imply major challenges for tomato breeders. Take for instance the difficulty of the incompatibility of a tomato’s taste and its shelf life. In large countries such as China and Brazil, where non-heated cultivation prevails, products have to travel enormous distances from growers to consumers. So the varieties intended for such regions must have an excellent shelf life. Generally speaking, with such varieties, shelf life is probably more important than the tomatoes’ taste. The breeders face the challenge of finding a good balance between the two. In regions with heated greenhouses, such as northwestern Europe, Korea, Poland, Canada and nowadays also Russia to an increasing extent, the distances that are to be covered are smaller, and fewer concessions have to be made.

A second challenge concerns resistance. Crops in non-heated cultivation have to tolerate a lot more than those grown in heated greenhouses. The former varieties run the risk of being affected by diseases sooner because of the presence of insects, which transmit pathogens. That risk is even greater in the case of crops grown outdoors on account of the fungi occurring in the soil and soil-borne diseases such as bacterial wilt in tropical zones. Kees Könst: “Needless to say that where varieties intended for such regions are concerned, breeders pay extra attention to aspects like shelf life and resistances.”



"A good example of co-creation is TomAzur®. In this case a **strong brand** offers the various chain parties **certainty**."





# Germany:

a country of **customs** and **traditions**

Germany is a country that cherishes its customs and traditions. And yet various trends seem to have been weakening the traditional outlook of these Europeans in the past few years. What trends are they and what does this development mean?

Social demographic changes and technical developments are often the driving forces behind trends. Things are no different in Germany. The population is aging and households are getting smaller, partly as a result of urbanisation and families with fewer children. A population of eighty million now comprises more than forty million households. And although today's consumers want to be able to make their own choices, they are more closely connected to one another than ever before by social media and the Internet. "Social media and the Internet supply such an amount of information that these contribute to the diversification in our market," says Regional Sales Director Central Europe Christof Flörchinger. "New information from consumers is supplied bottom-up into the chain continuously. This has allowed the market for organic produce to have grown tremendously in Germany."

## Convenience vegetables

Convenience vegetables have been an important trend in large parts of the Western world for many years now. The products concerned are often to be found pre-sliced, preprocessed and prepacked, all ready-to-eat on supermarket shelves. This form of convenience is less popular in German supermarkets. Flörchinger: "German consumers like to buy straightforward affordable end products that haven't undergone much processing like pre-slicing. That's not to say that German consumers don't want convenience vegetables. There's certainly a demand for innovations that offer some convenience or different flavours, especially if they're also geared to small households. Good examples are mini fruit vegetables and smaller types of lettuce such as midi cos lettuce. Rocket, a product that is very popular among German consumers, combines all these aspects, and then the price is suddenly no longer the all-decisive factor."

## Diversification

So German consumers are traditionally very cost-conscious, also when it comes to vegetables. That explains the tremendous popularity of discount supermarkets such as Aldi, Lidl, Netto and Penny. About half of all the German supermarkets are such discounters. They stock smaller ranges, with less variation in vegetables. German consumers seeking more diversity can visit the standard supermarket chains like Rewe, where they will find the specialties they want, such as mini pointed peppers, many different types of tomatoes and a wide range of lettuces. Flörchinger: "We see that the standard supermarkets are focusing more and more on diversification. They want to distinguish themselves from other supermarkets and attract customers by offering products that are not to be found in many ranges – specialty products such as midi plum tomatoes, Santa tomatoes, cherry tomatoes on the vine, conical sweet peppers and cos lettuce. And also product concepts such as pumpkins in decorated packaging in the days leading up to Halloween. This approach appears to be successful: consumers who have more money to spend indeed like to spend it on fresh vegetables. Taste, shape and colour are then the decisive factors."

## Kohlrabi, typically German?

Kohlrabi was first grown in northern Europe in the sixteenth century. The product's name tells us in which part of northern Europe that was: 'kohlrabi' is a German word, with Kohl meaning 'cabbage' and Rabi 'turnip'. As a member of the Brassica oleracea family, this vegetable is related to Brussels sprouts and other familiar cabbage varieties such as cauliflower and broccoli. Germany produces 40,000 tons of kohlrabi a year and also imports the vegetable from the Netherlands, Italy and neighbouring countries to meet its annual consumption demand. Throughout Europe and around the globe, kohlrabi is considered a typically German vegetable.

Kohlrabi is versatile and healthy and meets the trend of 'forgotten vegetables'. This vegetable may not be entirely 'forgotten' among German consumers – although it is indeed a novelty for many of the younger generation – but outside Germany it certainly is. Flörchinger: "Our breeding programme includes a few new kohlrabi varieties that may well put this vegetable back on the global map."





# Top 3

## Open field summer vegetables

1. Iceberg
2. Radish
3. Spinach

## Greenhouse 2013

1. Tomatoes
2. Corn salad
3. Cucumbers

## Vegetable consumption: expenditure per household 2013

1. Tomatoes
2. Sweet peppers
3. Asparagus

## Local-for-local

These aren't the only developments that are currently taking place on the German market. Social media and the Internet connect consumers all over the world. In spite of these developments, German world citizens also like to focus on their local community and contribute towards their local economy. This, combined with the desire to reduce the carbon footprint, has greatly boosted the demand for regional produce – what is referred to as local-for-local – in the past two to three years: products that are produced close to home and go straight from the land to the shops.

Whereas farmers in the colder northern parts of the country used to grow mostly iceberg lettuce, the cultivation of products that were traditionally grown in the warmer south, such as radish, spring onions and corn salad, has increased. And the other way round, iceberg lettuce is now also grown in the southern federal states, alongside the usual range of vegetables. The products' packagings nowadays even specify whether they were grown in the state concerned. "All this means that we had to adapt our varieties to make them suitable for cultivation under different climate conditions. The greatest distance from the very north of Germany to the south is just over 875 kilometres, that from the east to the west is 640 kilometres. Needless to say such

distances imply substantial differences in conditions, especially for produce grown outdoors. The local-for-local trend has led to a considerable increase in greenhouse cultivation, but in Germany outdoor cultivation still prevails in absolute terms. The varieties that are grown today have meanwhile been improved so much that they can be cultivated anywhere in Germany to meet the local-for-local demand."

## Foreign influences

In spite of its popularity, local production is not sufficient to feed Germany's more than eighty million occupants. So the country is largely dependent on imports, especially greenhouse vegetables from Spain and the Netherlands. Flörchinger: "The leading crops in Germany are onions and carrots, closely followed by lettuce. Moreover, we see foreign influences increasingly supplementing our traditional crops." Those influences come mostly from the neighbouring countries. For example, in Germany you now find large-scale production of corn salad, which originated in France. And Italian influences are evident in the different types of tomato that are now available, and in basil, fennel, flat-leaved parsley and rocket. Flörchinger: "The cultivation of rocket in particular has really boomed the past few years and it's now a top ten crop in Germany. It started with the import of rocket from Italy, but Germany is now the third market for this crop, after Italy and the United States. And it's still growing." Part of the production is exported to Scandinavia and the Netherlands, like that of radish and other herbs, but the consumption of this herb has increased substantially in Germany itself, too. The long cultivation season and competitive professional cultivation have caused German exports to expand considerably this century."

## Innovative capacity

Germany is still the no-nonsense country where hard work and the value of the euro are key concerns. But even this country is susceptible to present-day trends, whether that concerning diversification in the range of vegetables at supermarkets, the demand for locally grown produce or influences from foreign countries. These factors may not have changed the traditional German outlook all that much, but they definitely have expanded it. And all this of course has consequences for the innovative capacity of breeding companies working together as chain partners and consulting one another about product concepts. They must also ensure that varieties are improved to make them suitable for cultivation under different climate conditions. Flörchinger: "We maintain close contacts with all the links in the chain – growers, traders, retailers and consumers – to ensure that we are flexible enough to respond adequately to market trends." ■

## Exporting product ideas

The idea of growing rocket in Germany itself proved a success. Germany not only successfully imports product ideas, but exports them too, as Enza Zaden Germany proved with its Hokkaido pumpkin. Together with Vitalis, the supplier of organic seed of the variety Orange Summer, this company played a pivotal role in the introduction of this edible pumpkin in France and northern Italy, which have embraced the small orange pumpkin as a seasonal novelty in autumn. The chestnut-shaped pumpkin is healthy and tasty, with the added advantage that its skin can also be eaten.



Over 25 years ago Enza Zaden expanded its commercial activities and began selling seed in Australia and New Zealand. Distribution company South Pacific Seeds, new to Australia at the time, turned out to be an indispensable partner. “The product range was limited and featured greenhouse cucumbers and tomatoes,” states Area Manager Australia and New Zealand Herman van der Gulik. “But a lot has changed over the years.”

Australia and New Zealand, two very interesting countries when it comes to climate, nature and fresh produce. Australia is a country of extremes, with intense sunlight, drying winds, long droughts, bushfires and floods. Not all areas of Australia are suitable for growing vegetables, so produce, which focuses mainly on local consumption, is grown in the best climatic areas and transported over the long Australian distances. Shelf life and firmness are therefore important requirements for fresh produce. Key products in the Australian markets are onions, pumpkins, spinach, cucumber, tomato, zucchini and lettuce.

Potatoes and carrots are the main export products.

New Zealand producers are more export focused and try to stretch production windows as much as possible with local production. This country exports eighty percent of its onion, kabocha squash and sweet pepper production. In winter months tomatoes and sweet peppers are imported from tropical areas of Australia, but during summer more tomatoes are exported to Australia than imported. This time of year it's too hot to grow tomatoes in Australia. Key products are lettuce, especially cos and Eazyleaf® types, sweet pepper, onions and pumpkins.



*Dave McDonald and Lindsay Knight from SPS Australia and Jan Panman from Enza Zaden.*

### South Pacific Seeds Group

Van der Gulik: “Australia and New Zealand are both very interesting markets for Enza Zaden due to the history of sales, product development and breeding with our long-term partners. We distribute through the South Pacific Seeds group, consisting of SPS and Terranova, in both countries. While physically the area is distant from Europe, our distributors have close relationships with our sales and breeding teams around the world.”

### History

In 1986 South Pacific Seeds was formed when staff from the dominant seed supplier of the time, Yates Australia, left the company after an ownership takeover. They setup a vegetable seed sales and seed multiplication organisation led by chairman Mr Phil Hancock. SPS later developed a sales organisation in New Zealand.

In 2003, SPS and Enza Zaden together purchased the Yates commercial division. The breeding activities of Yates, focused on lettuce, onion and pumpkins, were incorporated into Enza Zaden. SPS took control of the Yates sales organisation, renamed it ‘Terranova Seeds’ and continued to operate it as a stand-alone distributor. All products previously bred and sold by Yates continued to be sold by Terranova in Australia and New Zealand.

Van der Gulik: “SPS has a large worldwide seed production operation with locations in Australia, New Zealand, USA and Chile. Sales in both countries take place via both SPS and Terranova, two distributors of committed and expert staff. The SPS New Zealand team has direct sales to growers, from their base in Pukekohe, and they have recently opened their Pukekohe seed coating operation to

service local growers. Terranova is the exclusive Enza Zaden hybrid onion distributor in both countries. Onion sales are a major part of our Australia and New Zealand turnover.”

### Strong cooperation

The breeding activities of Enza Zaden in Australia and New Zealand focus on onions, pumpkins and cauliflower. Recently screening for spinach has started. There is strong cooperation between technical people from the distributors and Enza Zaden's local breeding teams. Louise Millar, SPS technical manager covered crops for Australia and New Zealand: “I really appreciate how open Enza Zaden is with their distributors and the access I have, especially with the sweet pepper and tomato breeding teams.” Terranova's Territory Manager in Pukekohe Alan McKee believes working together has delivered some great varieties like the onion variety Plutonius.

Van der Gulik adds: “In recent years Enza Zaden and SPS have worked together to develop a strong relationship in this area. We assess trials together, from in farm trials to first screening in many crops. We also hold field days together for salad crops, greenhouse crops, pumpkins and onions. Moreover, SPS New Zealand and Enza Zaden also work together on other projects, such as the Young Grower Group we have started together to boost the interest and innovation of the next generation. We have shown that we have a depth of knowledge, passion and genetics to work together for success. And as the SPS Open Field Crop Manager Steve McCraith recently said about the speed of lettuce breeding: ‘If we don't work together on this, we've got nothing.’ It sums up how working together breeds more success.” ■

# Down under

with **South Pacific Seeds & Terranova Seeds**





# Fruit Logistica 2015

From 4 - 6 February the Fruit Logistica, the leading international meeting platform of the fresh produce trade, takes place in Berlin again. For this edition, the Enza Zaden booth, with the theme 'healthy food' is once more ready to welcome you.

A large presentation of our varied assortment of healthy vegetable varieties will be available at our booth. Chef René will prepare healthy bites with our products. We also have a presentation of hydroponic lettuce in our hydroponic bin. Moreover we will give specific attention to melon this year. "Melon is a worldwide product, loved for its sweet taste," explains Carmen Ampt, Junior Portfolio Manager. "Enza Zaden now has developed some fully netted cantaloupe varieties that have a great taste and a good shelf life. For a product that is as much exported as melon, good shelf life is a very important characteristic. But with melon, the taste is directly related to the shelf life, so varieties that have both these qualities are very unique."

In our concepts and brands corner you will find examples of concepts we've developed together with other parties in the chain.



## Field days

Enza Zaden will again organise a lot of field days and attend major trade fairs in 2015. Highlights will be the lettuce days in Spain in February, the Turkish tomato days in May, our Brazilian onion tour in July and our German field days in September. Enza Zaden will also attend trade fairs in Berlin (Fruit Logistica) in February, Hortitec in Brazil in June and the Asia Fruit Logistica in Hong Kong in September. A full overview of Events 2015 is included in this The Partnership edition.



Hall 1.2  
Booth C-06

4-6 February

# Event calendar

<b>FEB</b> WEEK 6	Fruit Logistica Berlin (E) Berlin   Germany	<b>JUN</b> WEEK 27	Protected Cropping Australia (PCA) Conference (E) Queensland   Australia
<b>FEB</b> WEEK 11	Indian Seed Congres (C) Agra   India	<b>JUL</b> WEEK 28	Brazil Onion Tour (FD) Brazil
<b>FEB</b> WEEK 7	Lettuce Spain (FD) Murcia   Spain	<b>JUL</b> WEEK 28	Agro Expo (E) Bogota   Colombia
<b>MAR</b> WEEK 10	AFSTA (C) Victoria Falls   Zimbabwe	<b>JUL</b> WEEK 29	Melon/cucumber week France (FD) Chateaufort   France
<b>MAR</b> WEEK 10	Jordan Field Days (FD) Jordan	<b>JUL</b> WEEK 31	Horticulture NZ Conference (C) Rotorua   New Zealand
<b>MAR</b> WEEK 11	Soil Management Field Days (FD) Auckland   New Zealand	<b>SEP</b> WEEK 36	Asia Fruit Logistica (E) Hong Kong   Hong Kong
<b>MAR</b> WEEK 12	Horti ASIA (E) Bangkok   Thailand	<b>SEP</b> WEEK 37	Field Days Germany (FD) Germany
<b>APR</b> WEEK 16	Young Vegetable Grower of the Year contest (E) Pukekohe   New Zealand	<b>OCT</b> WEEK 41	Determinate Plum tomato (FD) Egypt
<b>APR</b> WEEK 18	Lettuce Field Days (FD) Pukekohe   New Zealand	<b>OCT</b> WEEK 44	Indagra (E) Bucharest   Romania
<b>MAY</b> WEEK 21	Export Tomato Turkey (FD) Turkey	<b>NOV</b> WEEK 45	Tamas (E) Dae-Jeon City   Korea
<b>MAY</b> WEEK 22	ISF (C) Kraków   Poland	<b>NOV</b> WEEK 46	House Fair Spain (E) Almería   Spain
<b>JUN</b> WEEK 25	Brazil Hortitec (E) Holambra   Brazil	<b>NOV</b> WEEK 47	APSA (C) Goa   India
<b>JUN</b> WEEK 25	House Fair   (FD) 's-Gravensande   The Netherlands	<b>DEC</b> WEEK 49	Growtech Eurasia (E) Antalya   Turkey
<b>JUN</b> WEEK 26	Agro-Innovation (E) Fukuoka   Japan	<b>DEC</b> WEEK 51	Leafy House Fair Spain (E) Murcia   Spain
<b>JUN</b> WEEK 26	AUSVEG National Convention (C) Queensland   Australia		

C = Conference | E = Exhibition | FD = Field Day



# Fair Planet



People and respect are important values in our company. This also includes having respect for the environment we live and work in. Corporate social responsibility, in other words – and our collaboration with Fair Planet is a perfect example of contributing to a better environment and operating in full harmony with it.



## Fair Planet

Dr. Shoshan Haran set up the non-profit organisation Fair Planet in 2012. Fair Planet focuses on vegetable variety trials with smallholding farmers in Ethiopia, transfer of technical knowledge and the set-up of a key demonstration farm for vegetables in Ethiopia. After receiving her Ph.D. in Plant Science, Shoshan worked for Israeli seed companies. “I was part of the industry that develops varieties for a number of different growing conditions, delivering a solution for many farmers all over the world. At the same time I was aware that malnutrition and hunger were rife in some parts of Africa. This was what prompted me to set up Fair Planet with the idea to bridge the gap between the leading seed companies and the smallholder farmers in hunger stricken countries.”

### Improving quality and yield

Fair Planet aims to improve food security and create economic opportunities in regions with high levels of poverty. To achieve this, Shoshan not only applies her own expertise and entrepreneurship but also taps into her network of contacts with major seed companies. Shoshan: “Ethiopia has ninety million inhabitants, around ten million of whom are small farmers. I am convinced that with high-quality seed and basic training, even farmers who use the simplest growing methods can improve the quality and yield of their crops. This then gives families enough vegetables to feed themselves and sell at market. Their nutrition and health improves, as does their economic situation, so they can invest in their children’s future.”

### Teamwork

Enza Zaden is one of four seed companies involved in this project. Through it they are together doing something beneficial for society. Fair Planet currently has three projects ongoing in Ethiopia. Trials with tomato varieties are taking place in Butajira, the southern central part of the country. “The success of Fair Planet depends on the expertise and goodwill of the participating seed companies.

These seed companies supply us with seed for the trials, wide-ranging knowledge and financial support. This gives us access to expertise and a very broad collection of varieties. Teamwork is the key to success.”

Apart from seed companies, the local ministry of agriculture and Haramaya University – the country’s largest university with 15,000 students on campus – are also involved. The university plays a major role in the other two projects on the development of horticulture in Ethiopia which are aimed at increasing productivity now and delivering technology transfer and capacity development in the future.

### Five-fold improvement in harvest

The initial results are very promising. The projects have shown that quality hybrid varieties can yield five times as many tomatoes as the average national harvest. What is more, fruit weight has increased from the approximately 40 grams yielded by the local variety to 120 grams with the high-quality variety, and these fruits are even more robust and have better keeping qualities. And this is just the beginning. Yet more new ideas are on the agenda for the future, such as tomato trials in the east of the country and the introduction of onion and chilli peppers and the development of training programmes for technology transfer and capacity development in the south-west.

### Shared passion and goals

Shoshan is delighted to be working with Enza Zaden. At a recent visit to Enkhuizen, it struck her that Fair Planet and Enza Zaden share the same passion and goals. “Our team felt the employees’ commitment and enthusiasm, and it felt almost like a family. It reminded me of the way things work on the kibbutz. I am also very happy to be working with Enza Zaden’s strong export team, because it is sometimes a major challenge to work in developing countries.” More information about this project available is at [www.fairplanetseeds.com](http://www.fairplanetseeds.com). ■

**“Teamwork is  
the key to  
success”**





# US organic market

## on an upward trend

As far back as the early twentieth century, British botanist Albert Howard observed that in traditional Indian farming practices, waste was re-used as compost and working with nature was considered of prime importance. In the 1940's, the expertise relating to organic cultivation techniques in the United States (US) started to grow, mainly thanks to the efforts of Jerome Irving Rodale, who is still considered today to be the father of organic farming. However, it would take another three decades before increased awareness of the environment would accelerate the growth of the organic industry.

“The rapidly growing global organic market is estimated at almost \$ 64 billion in 2014,” says Vitalis Regional Business Manager, North America Erica Renaud. “The US and the EU together account for 97 percent of the global revenue in organic products.”

### Sustainability and nutritional quality

The increased popularity of organic produce among consumers is motivated by multiple factors, of which sustainability and nutritional quality are the most important. Consumers are happy to make their own contribution towards a better environment. They also believe that the nutritional quality of organic produce is far better than that of conventionally produced food. Renaud states: “But health, food safety and quality are also key factors. As organic farmers do not use synthetic chemical sprays to manage their production systems, this produce has had much less exposure to chemical residues. This reduces the risk of exposure to chemicals known to contribute to diseases such as cancer. We also notice that consumers often prefer the flavour of organic produce.”

### Organic farming in a nutshell

But what is precisely the difference between organic and conventional farming methods? Is it only related to the absence of

use of synthetic chemical inputs such as fungicides, pesticides, herbicides and fertilizers that are used in conventional agriculture systems? No, organic farming is much broader than just that and also includes crop rotation, diversity of crops, and often multiple market outlets. Organic farming systems are based upon organically-derived inputs such as compost and animal manure and focus their management on stimulating long-term biological self-regulatory processes to achieve resilience for stable productivity. And this comes with a great challenge.

Organic farmers have fewer options to intervene in the short-term when weather and soil conditions are not favourable for optimal crop growth. One of the challenges for this sector is to comply with the Principles of Organic Agriculture concerning health, ecology, fairness and care. Renaud: “Organic growers do not want their varietal assortment options limited through strict organic seed regulatory enforcement. Biodiversity – both broader genetic background and cultivar diversity – is an important component within management practices to enhance stability and resilience in an organic agricultural system. Therefore, they would rather have cultivars suited to their management system than adapt their management to cultivars.”



### The United States, a growing organic market

On a global level about 37.5 million hectares of agricultural land are now managed organically by 1.9 million producers. This means that within a period of slightly more than a decade organic agricultural land has more than tripled. With 32 percent of the global organic farmland, Oceania is the region with the largest area of organically managed land, followed by Europe, 30 percent, and Latin America, 18 percent. By country, the US is third, after Australia and Argentina, as the country with the most organic agricultural land: 2.2 million hectares. The organic production in this country is comprised of both large-scale growers concentrated in specific regions and numerous small scattered acreages across the country that produce in a broad range of environments to service local and diverse food markets.

### Fatigued by poor quality food

A niche industry in the huge food sector just a decade ago, consumer purchases of organic food now account for more than four percent of the \$ 760 billion annual food sales in the US. Ten percent of the fruits and vegetables consumed in the US are organic and the turnover with organic products has grown more than fourfold since 1999. Renaud: “The US organic market is the

fastest growing global market. The growth rate of organic food sales, which has averaged almost ten percent every year since 2010, has dwarfed the average annual growth of just over three percent in total food sales during that same period. My projection is that the US is fatigued by poor quality food. There is an incipient fear of food quality and safety, and contamination of the food

## Top 10

The ten countries with the largest markets for organic food (2012):

- |                  |                |
|------------------|----------------|
| 1. United States | 6. Italy       |
| 2. Germany       | 7. Switzerland |
| 3. France        | 8. Austria     |
| 4. Canada        | 9. Japan       |
| 5. UK            | 10. Spain      |



With 50,000 production acres, the Californian based Earthbound Farms is the world's largest certified organic vegetable grower. Renaud: "We work collaboratively on product development and sell them seeds of arugula, lettuce, spinach, cauliflower and culinary herbs such as parsley and dill. Earthbound is motivated to use 100% organic seed of the highest quality, most innovative cultivars."

system with genetically modified foods. The lack of environmental protection in conventional agricultural systems has perpetuated an industrialized food system that does not protect the environment, nor the consumer."

Fresh fruit and vegetables have been the top selling category of organically grown food since the organic food industry started retailing products over three decades ago, and they are still outselling other food categories. The US makes up 44 percent of the global organic food sales and the market is still growing. Unfortunately, this growth also has a downside; farmland in the US is not being converted to organic at the pace needed to meet the growing demand for organic. This constrains growth for both individual farms and the organic sector overall. Renaud: "So the proportion of supply comes more and more from outside the US. Farmers in over one hundred countries, mainly Mexico, are now producing food for the US organic market."

### Organic food marketing

Most organic sales take place through conventional and natural food supermarkets and chains. But there are two striking differences between conventional and organic food marketing. First of all, organic marketing is value driven with a strong focus on sustainability and health. Storytelling – which allows consumers to 'know their farmer' and provide confirmation that 'their support of the local food system' is an important contribution – is key to organic produce marketing. Renaud: "There are many companies now that are fully integrated and have their own brand: they grow, pack and market their own products to the end consumer and/or retail market. They tell their own unique story including who grows for them, where the product comes from, and any nutritional benefits."

Another difference is the use of direct markets. Only about 1.6 percent of the US fresh produce sales are through direct sales. However, with the growing awareness of environmental issues, the demand for locally grown organic product has heightened. This has resulted in a steady growth of farmers' markets – where the demand for organic products is strong – in the last two decades to over 8,144 in 2013.

### Future

The organic consumer market in the US, already the largest in the world, has been growing at over ten percent per year. Renaud: "And there is no indication that this is slowing down. Thanks to strong partnerships with US producers, and more and more producers abroad, we take on the challenge to continue to meet this increasing demand for organic. And supply them with the broadest assortment of 100% certified organic seed available in the marketplace." ■



# An 'Onionbelievable' team

**Onions can make you cry, including breeding them. In many ways onion is not the easiest of crops to work with and provides plenty of challenges in every stage of developing high quality varieties for our customers. From breeding to seed production, phytopathology, biotechnology, sales, marketing and logistics, onion can be a difficult 'beast' to handle. And with a two year breeding cycle, sometimes the goals can seem a long way off. So, it is good to keep a strong sense of humour!**

We have a saying in the onion team that probably applies to breeding all crops, and in fact, also to life itself. It captures the 'risk taking' nature of our industry. When we think we are close to success after many long years of breeding for a certain market, we use the old saying "We can see the light at the end of the tunnel". However, in the onion team we also add a sentence: "Let's hope it is not the headlight of a train racing towards us!" So, though we like to have a bit of fun and a 'light' approach to the job of breeding onions, we also realise the vital importance of looking ahead. With such a long term crop, the sooner we detect a market trend the sooner we can start to change our breeding direction, and hopefully hit the new target before our opposition does. A bit like the Captain of the Titanic avoiding an iceberg: if you detect the danger too late, you don't have time to turn and avoid it. We need to keep our eyes open and to the horizon.

Since Enza Zaden purchased the small breeding programme of Yates in October 2003, the programme has undergone rapid growth. The philosophy of investment in R&D was a 'breath of fresh air' to the Yates breeders. That commitment has seen the programme blossom from one breeder and one seed production guy with a few casuals in Narromine to a strong international network with locations in New Zealand, North and South America, South Africa and Europe.

A relatively new thing for us – new in 'onion years' anyway – is breeding 'Long Day' onions. These onion types are grown in the latitudes of the world where the daylength in summer gets very long, such as North America and Europe. Our Australasian programme mostly breeds Short to Intermediate Daylength types, yet a huge percentage of the world uses Long Day ones. In 2008 we were given the 'green light' to look for a Long Day breeding site, and in 2010 we initiated the fulltime programme in Tarquinia, Italy. Since then our EU team in conjunction with the 'sister teams' in New Zealand, USA and Australia have made rapid progress in breeding for the major Long Day markets of the world.

In other words, our highest priority and focus is and always will be on 'Teamwork'. Without a strong team even the best products won't fly. ■

Lewis Lydon, Crop Breeding Manager Onion





# Journey *of the* Seed

## Getting there efficiently and in time

The seed has been cleaned and graded, and the quality has been checked and enhanced. Only the very best batches make it through the Warehouse Management department into storage, ready to be packed and dispatched. Quite simple, you might say. But nothing could be further from the truth.



“It sounds so straightforward, but behind the total seed flow there is an entire system which follows the seed going through our company from production to delivery,” Pieter Pereboom explains. “And there needs to be, to make sure the ten thousand or so shipments we send out every year run efficiently.” As soon as Customer Service has entered the order and Stock Management has allocated a particular batch of seeds to it, the machine operators get to work. Orders consisting of twenty batch or fewer are done by hand; larger orders are automated.

### Barcodes

Pereboom: “Here in our department you can clearly see how technology speeds things up. We used to only have a few machines that packed seven packs per minute, but now we use machines that process 25 bags or cans of seed in the same time. And some machines even produce the bags themselves from a roll and print the labels in several languages or fonts directly onto the packaging. We have also started working with personal hand-helds which we use to scan barcodes at every step. This helps us keep track of the seed flow and eliminates the risk of errors.”

### Linking pin

All orders are managed by the Customer Service department. Once the seeds are packed in the Packaging department, they also send them out. Customer Service is the linking pin in the order processing system. “To put it briefly, Customer Service handles all orders and shipping, both to our commercial subsidiaries and to distributors, plant raisers and greenhouse growers,” Manager Customer Service Ruud Groen explains. These are all commercial shipments, but seeds are also sent to non-commercial recipients such as R&D stations and production locations. Seed in commercial quantities is produced worldwide, and 95 percent of this seed comes back to the Netherlands for processing and inspection. Groen: “So sometimes you might find us sending sowing seed abroad, importing produced seed and exporting it back to the same region as commercial seed. This sounds like a waste of money, but it is in fact much more efficient. And surprisingly, it usually works out cheaper too. We have the knowledge and the machines here, and every day we have an inspector and shippers calling in. So there’s no delay in the process here. And remember that the main part of each batch we produce is sent to a different destination from their country of origin.”

### Phytosanitary rules

Fulfilling orders and arranging shipping may sound straightforward enough, but there is more to it than meets the eye. Seed is a living organism, so you can’t simply send it across the border: it could be carrying diseases, bacteria and viruses. Groen: “We therefore have



Enza Zaden exports vegetable seed to more than 120 countries.

to be able to demonstrate that the seed in every shipment is healthy and complies with phytosanitary rules. This starts with the import phytosanitary certificate that shows inspections and other quality tests done in the country of origin. An inspector calls in every day to check these phytosanitary certificates and approve the shipments.”

Countries outside the EU all have their own specific laws and regulations and therefore require documents that show that the seed is healthy and of high quality. Groen: “To give you an impression, we produce seed in more than thirty different countries, we export to more than 120 countries and our product range consists of more than sixty different types of crops. There are different rules and requirements for every combination of crop, seed origin and destination. So you can imagine how many different combinations there are. In addition, shippers, customs and, of course, customers all have their own specific rules and requirements. Sometimes a shipment can be accompanied by as many as eight different types of documents, and in multiple copies.” As Groen explains, relationship management is therefore also a key part of their work. Good relationships are not only essential for a good working partnership; local customers are also an important link and source of information on local regulations and imports. Groen: “They are the key players who help make our exports and their imports run more smoothly, so they are very important to us.”





## Facts & figures Packaging & Customer Service

**13,000** shipments per year, of which **2,000** non-commercial and imports  
 More than **2.2 million** packs **14,000** orders

### And where do the consignments go?

**30%** within Benelux **20%** to commercial subsidiaries and **5%** to customers on their behalf **35%** to the territories represented by Enza Zaden Export **10%** to producers and R&D stations  
**5%** other consignments to third parties

### Constantly changing regulations

In addition to the enormous volume of phytosanitary and fiscal measures, changes to regulations and new projects are introduced almost every year. Groen: "To get the seed to the customer fast, we are increasingly sending it out directly to our subsidiaries' customers. The subsidiaries book these orders and handle invoicing, but we send out the seed. In this way we can have seed sent from a foreign location such as the USA to another country such as Brazil and invoice the customer ourselves from the Netherlands. In that case it is important to ensure that all tax law requirements in all the countries concerned are met on one single order."

Another more recent development of the last few years: ever stricter international anti-terrorism laws and regulations. Groen: "We have had to expand some of our internal seed processing and packing procedures. For example, staff have been given special training, we now store packs to be air freighted in lockable cages with surveillance cameras, and we seal boxes with special tape. As a result, we are now certified as Approved Air Freight Agent and as such we are permitted to perform security checks ourselves. That is much cheaper for us than having all our shipments checked by the shipper. And importantly, it reduces the risk of delays.

A third example is the Nagoya Protocol, which came into force very recently. This enables the benefits of genetic material to be shared between the user and the provider. Groen: "When we ship research material we have to be able to demonstrate that it meets the Nagoya requirements.

So we decided to centralise all these aspects in one department manned by several customer service, import and shipping specialists. This is enabling us to build up a lot of very reliable expertise and supporting documents of evidence and a large shipping network. And that's what it is ultimately about: ensuring that our customers receive the right products in the right quality and at the right time." ■

## Machines under the spotlight

### Filling machines

The filling machines weigh the seeds with a 14-head multi head weigher or count them with a camera. These machines fill bags of 100 grams, or from 100 grams to block bags of approximately 2,500 g.

### Canning line

Pelleted seed, such as lettuce, endive and some tomato seed, are vulnerable because of the extra layer. Cans available in three different heights provide the necessary protection for these products. Ninety-five percent of orders for canned seed are for pelleted seed. In general, only non-pelleted seed is canned if a country's legislation only permits cans.



# Sweet pepper



*50 years*  
**young, still g(r)o(w)ing strong**

We can't really speak of an official anniversary, but around fifty years ago sweet peppers started to tentatively but steadily cross the Italian border and sweep the West European market. Enza Zaden was quick to embrace the crop and contributed greatly to the roaring success of blocky peppers with several much talked-about hybrids. The past fifty years exports from the two leading cultivation areas – the Netherlands and Spain – have grown from less than five to more than 800 million kilos. And the world still offers ample growth potential, says market researcher Hans Verwegen. Enza Zaden aims to make the most of those growth opportunities on all continents with new product concepts and in close, market-oriented cooperation with chain partners.

Fifty years ago hardly any sweet peppers were grown in Western Europe. In those early days the Netherlands was already the leading production country in that area, but the acreage was still a lot smaller than those of, say, Italy and Hungary, where this fruit vegetable was more common and more widely appreciated. 1965 was the first year in which more than a million kilos of sweet peppers were produced in the Netherlands. By 1972 that was already ten times as many. 1990 saw the 100 million-kilo milestone and 2003 that of 300 million kilos.

"You can say that sweet peppers reached maturity in Europe in the 1990s," says market researcher Hans Verwegen. "Ever more consumers came into contact with them in shops and restaurants, at friends' homes and on holiday, and once you've tasted sweet peppers, whether raw, fried, stuffed or grilled, you want to keep eating them. Most of the consumers who never buy sweet peppers are elderly people. And as time goes by the number of those non-buyers will rapidly decline."

## Ideal fresh products

Verwegen believes that the fast increase in the consumption of sweet peppers is to some extent associated with the increasing popularity of supermarkets as retail outlets in the last quarter of the last century. "Sweet peppers are ideal fresh products for supermarkets," he explains. "They add colour to the shelves, look inviting and retain their fresh look for longer than leaf vegetables. Those are ideal characteristics for retail formulas focusing on self-service and impulsive buying behaviour. So it's not surprising that supermarkets enthusiastically included this product in their ranges in the 1980s." The fact that the Spanish and Dutch seasons succeed one another means that sweet peppers are available all the year round, and especially in the winter months they were a welcome addition to the range of vegetables on offer in those early days.





New growth markets

In the meantime sweet peppers have become so common in Western countries that the market can be said to be reasonably saturated. But Verwegen sees plenty of growth potential in Asia and South and Central America. “In Asia, Japan took the lead for a long time,” he explains. “The country started to import sweet peppers from the Netherlands in the early 1990s to meet its growing demand. Korea soon took up the gauntlet and has been exporting to Japan for quite some time now, whereas its own population initially consumed very few sweet peppers. But things are changing rapidly there too, which goes to show that the steep growth curves that characterised consumption in Europe are far from exceptional. Domestic consumption is also increasing in Mexico, which exports large quantities of blocky peppers to the United States and Canada.”

Product and concept innovation

While the growth in the rest of the world concerns mostly pepper types and varieties that have already more than proven their worth, further growth in relatively saturated markets will have to be boosted by product and concept innovation. With its rich history and experience in pepper breeding, Enza Zaden is in the frontlines in this field, too, as also underlined by recent successes such as Baby Bells, Cherry Peppers and the versatile Tribelli® concept. And with Cornelio® (see the box), Enza Zaden now also has an innovative concept for Italy, the cradle of the modern European market.

Partnership

“The success of new concepts is very much dependent on the chain partners you choose,” says Verwegen. “The days in which new varieties almost automatically found their way to growers, retailers and consumers are far behind us. Shops are now lavishly stocked and everything’s got to be perfect: a distinctive product, sound cultivation methods, excellent product quality, appealing packaging and the use of the right stories to entice consumers. First of all you need pioneers who are capable of introducing and testing new concepts. If a concept catches on, you need partners who will be able to facilitate fast growth in production and market penetration in a reliable way. Enza Zaden makes efforts to bring the right partners together step by step, in every phase.” ■

This winter season Cornelio® will have to prove its worth as a product that offers Italian growers and consumers added value. Expectations run high, especially those of Andrea Campus, Crop Business Manager for Fruity Vegetables at Enza Zaden Italia. “Cornelio® is a really distinctive variety that can be seen as a modern variant of traditional local varieties such as Corno,” he explains. “Italians are accustomed to fairly large, thick-walled conical fruits that are mostly stuffed and then grilled or baked in the oven. Cornelio is also very suitable for raw consumption.”

Distinctive product

Cornelio® differs from traditional Italian varieties in its modest size and small placentas that can be easily removed. Campus: “Cornelio® has the thick wall of the traditional Italian varieties, but is a little smaller and can be used in more ways. The fruits have an attractive external quality and grow to a length of at most 20 cm at a weight of 150 to 200 grams, so ideal for today’s smaller households. Traditional varieties produce distinctly longer, heavier fruits.”



Andrea Campus: “Cornelio is a really distinctive variety that was developed in a breeding programme using traditional local varieties.”

# Italy pulls out all the stops for Cornelio



The attractive fruits can be excellently used in hot dishes or eaten raw in salads. The variety is also very appealing for growers: it’s highly productive, very resistant and can be grown all the year round. “It could easily be grown all over the world, but for the time being it will remain an exclusively Italian product,” says the Crop Business Manager. He is also very enthusiastic about the high concentrations of antioxidants, including vitamin C. “Because of the strict regulations we can’t make any health claims, but you can take my word for it that Cornelio® is extremely good for you.”

Partners in marketing

Enza Zaden opted for exclusive cooperation with Valfrutta, by far the largest growers’ cooperative in Italy, in the hope of turning the variety into a major success for Enza Zaden, growers and retailers alike. “Valfrutta is a strong partner with a lot of marketing experience and a very broad product portfolio,” explains Andrea. That makes it possible to introduce Cornelio® widely, with effective marketing support. Consumers are invited to taste the product at displays at the many retail outlets. Raw sweet pepper will be a new experience for many of them. “In the near future we are also going to launch a special website

for this remarkable pepper variety,” adds Campus. “To offer consumers information on the product’s origin, how it can be prepared and when it is available.”

Made in Italy

In the 2014-2015 winter season cultivation is still limited to an acreage of sixty hectares of plastic film greenhouses in Sicily. In spring the variety will be planted in northern Italy too. “Together we’ll get the acreage to expand slowly, in response to the demand, which we will of course actively promote,” says Campus. “It’s still too early to predict how successful it will be, but the first signs are very positive. Valfrutta is now selling Cornelio® in other countries, too, but its cultivation will for the time being remain limited to Italy, as part of the total concept’s unique selling proposition.”

**CORNELIO®**  
il Peperone Dolce Italiano



# Science in a nutshell

## The structure of DNA, the Genetic Material

The discovery of the structure of DNA is more interesting than you may expect. Manager Molecular Biology Gert-Jan de Boer gives an insight into one of the discoveries that have been of great importance for vegetable breeding companies.

DNA, or deoxyribonucleic acid, is the genetic material contained in all living organisms except for a few viruses. It was first isolated in the nineteenth century by a Swiss chemist who called it 'nuclein'. It was only during and shortly after the Second World War that the results of some scientists began to suggest that DNA could well be the material responsible for passing on genetic information from one generation to the next.

### Rosalind Franklin

In the 1950s various scientists were making efforts to solve the mystery of the structure of DNA. That kind of work is hard enough today; in those days it was a lot more difficult. A female scientist who was involved in that research was Rosalind Franklin. She produced DNA crystals, which she photographed with X-rays, exposing her own body to the radiation in the process. She then tried to unravel the structure of the DNA in the photos. An Englishman called Watson and his American 'partner in crime' Francis Crick had modelled DNA in the form of a double helix. In one of Rosalind Franklin's photos they saw proof of their model. And the rest is history. In 1962 they were awarded the Nobel Prize for their work together with Maurice Wilkins, the person who had shown Rosalind Franklin's results to her rivals, Watson and Crick.

### Nobel Prize

And what about Rosalind Franklin? Unfortunately for her, only people who are alive qualify for nomination for a Nobel Prize, and Rosalind Franklin died of cancer in 1958, at the age of 37. But you'd think that someone who had carried out such important experiments would have been nominated while she was still alive. After all, Watson and Crick published their work in the journal Nature in 1953, and that same journal also published Rosalind Franklin's results! As the nomination records of the Nobel Prize committee are sealed for fifty years, it has only recently become apparent that Rosalind Franklin was never nominated. Even though we don't know whether she would have succeeded in identifying the structure of DNA on the basis of her results alone, this is indisputably a great injustice. But we are talking about things that happened sixty years ago. In those days, most women were still to be found at the kitchen sink. But even then there were already female scientists who were making important discoveries, or had already done so. Another good example is Barbara McClintock, who speculated about the mechanisms of genetic change back in 1950 already. Fortunately, she did receive a Nobel Prize for her work, if only in 1983.

### What does all this mean for breeding companies?

But what is so important about Watson and Crick's discovery? Well, a dividing cell must distribute its DNA equally between its two daughter cells. Watson and Crick's model showed that when the double DNA helix is unwound, each strand acts as a template for the production of the absent strand. This makes copying or replicating DNA a piece of cake! We still benefit from this discovery every day. For example in using and developing DNA tests. But what was probably even more important for, for instance, vegetable breeding companies was the possibility of combining the best genetic characteristics to arrive at good new varieties. And all this thanks to an all but forgotten Rosalind Franklin and a few boffins experimenting with DNA models. ■



Gert-Jan de Boer is Manager Molecular Biology at Enza Zaden. He studied Plant Physiology at the University of Amsterdam and started working at Enza Zaden in 2005. The work of Gert-Jan and his colleagues in the bio-tech lab helps us to not only speed up the breeding process, but also to ensure it runs a lot more efficiently. Enza Zaden still breeds in the traditional matter, but it combines our knowledge and creativity with modern and highly advanced technologies.



# Artificial growing light brings advantages

In Scandinavia, greenhouse vegetable growers have been using grow lights to help their crops through the long, dark winters for many years now. In the past decade this technology has become more popular further south, in the Netherlands, too. Almost one third of the total Dutch tomato acreage is now equipped with artificial light systems, and that proportion is still increasing annually. Growers in countries around the Netherlands, and in North America, too, are also discovering the advantages of extra artificial light.

The Netherlands has for many years been Europe's number-one producer of tomatoes in the summer season. They are all grown in glass greenhouses, most of which are heated with combined heat and power stations or gas-fired boilers. Most growers plant their plants in stone wool slabs in December, to stretch the traditional production period from early April until the end of November.

"In the past decade many growers equipped some of their greenhouses with lighting systems," says Maarten van den Heuvel, Crop Sales Manager Tomato "They answer the growing demand for a continuous supply of tomatoes of a reliably high quality."

The Crop Sales Manager goes on to point out that such lighting systems are now being used in almost 600 ha, corresponding to about thirty percent of the total acreage in the Netherlands. Growers with combined heat and power stations didn't need much persuasion to start using such a system, as it enables them to generate electricity at relatively low costs. Even so, the cost price of the tomatoes concerned is quite a bit higher.

## Advantages

Marc Mens, Crop Specialist Fruity Crops in Northwestern Europe, explains: "Using artificial lights implies several advantages. For a start, it ensures customer loyalty, because buyers can rely on more or less the same quality from their usual suppliers all the year round. In the winter season in particular there used to be substantial shortages in the top segments, and they have now been partly eliminated. And as tomatoes of high quality fetch better prices in the winter they often pay back your investments. An added advantage of spreading your production like that is that you have a slightly smaller supply in the summer period, when prices are usually very low. So you're killing two birds with one stone." According to Van den Heuvel, the acreage of tomatoes grown with lighting is in some segments, such as that of snack tomatoes, not increasing as rapidly as that in, say, the segment of tomatoes on the vine. Spain and North Africa are formidable competitors in those segments because of their lower cost prices.

## Sodium and LED lamps

Almost the entire acreage of the greenhouses with artificial lights is equipped with high-pressure sodium lamps of 600 or 1,000 Watt suspended above the crops. A small, but growing number of growers also have LED lamps hanging between the rows of plants. This combination is also known as hybrid lighting. "Sodium lamps generate a lot of thermal radiation besides growing light," explains Van den Heuvel. LED lamps are far more efficient, and can also be used between the plants. But at this moment they're still more expensive to buy."

## Hybrid lighting

Research and practical experience have shown that tomato plants do best under hybrid lighting. The top parts of the plants need heat, which is generated by the sodium lamps. LED lamps can be suspended between the plants, to systematically ensure larger amounts of light lower down the crop so that the plants remain productive over greater lengths. That promotes a slightly higher growth rate, and above all heavier tomatoes. "Profits in Dutch greenhouse

horticulture have been under pressure for quite some time, but I expect that more investments will be made in hybrid lighting when the results improve," says Mens. "I'm pretty certain that's what's going to happen in the future."

## Different form of control

As crops grown with such lighting start to develop far earlier than traditionally grown crops, i.e. in August instead of December, the plants have to grow at a decreasing natural day length for a few months. "In combination with the increasing plant load, such crops call for a different form of control than standard crops," explains Mens. "For a start, you have to keep your eye on the moisture content. In late summer the relative humidity always rises, while the expanding crop introduces extra moisture into the greenhouse through transpiration. On top of that, energy screens tend to be closed more often as the nights grow colder. So you then have to make sure you discharge enough moisture." According to Van den Heuvel you need varieties with sufficient generative development combined with vigour for the standard types of tomatoes. The tomatoes must be of a consistent quality and ripen equally. Another aspect that is also important for specialties is taste, which must be consistent. Enza Zaden tests all its varieties intended for greenhouse cultivation to check whether they are indeed suitable for that type of cultivation, of course in greenhouses with lighting systems.

Maarten van den Heuvel:

**"Artificial light is an answer to the growing demand for a continuous supply of tomatoes of a reliably high quality"**



# Tasty Tom: a practical example

The past twenty years the Dutch growers’ association Frutanova has acquired a circle of loyal customers with Enza Zaden’s variety Campari, which is sold under the brand ‘Tasty Tom’ in Europe. The association comprises five companies, which together grow this tasty variety in a total acreage of 65 ha. Three of those companies, one of which is Triomaas of the Kouwenhoven family, use artificial lights.

“We have greenhouses with an area of 12.5 ha and seventy percent of that is equipped with sodium lamps hanging above the plants,” says grower Roland Kouwenhoven. “Around 2000 the first tomato growers in the Netherlands started to use grow lights, with an intensity of 10,000 Lux, or 130 µmol. Nowadays that’s usually 170 to 200 µmol.” Triomaas started experimenting with grow lights in 2004, to explore the possibility of harvesting crops earlier. The installed capacity proved too low for real winter production, but the company’s aims soon became more ambitious.

### Customer loyalty

Kouwenhoven: “Artificial lights offer us two major advantages: customer loyalty in winter and the possibility of optimising our energy balance. Without artificial lighting it would be impossible for us to produce all the year round in the Netherlands. Artificial lights give us that possibility, and prevent our customers resorting to other suppliers.” The grower continues: “We also all have combined heat and power stations which, as their name implies, generate both heat and electricity. We are now self-supporting on both fronts. When the system is producing enough light for half of our greenhouse area we store the generated heat that is not immediately needed in a buffer tank. And if the system has to operate in the daytime to meet our heat needs we can optionally supply power to the general electric power supply. This enables us to make the most of the natural gas that we use as our source of energy.”

### Cultivation method

Tomatoes that are grown with lighting are of very good quality. “In our market segment it’s important to be able to offer consumers the same taste experience all the year round,” says Kouwenhoven. “And we have no difficulty doing that. But the tomatoes we grow with lighting do have to fetch good prices because they cost quite a bit more to produce. The overall

production is slightly higher, because the crops produce for a bit longer than standard crops. But in summer the crops produce slightly less, because they are then fairly old and less active.”

Kouwenhoven doesn’t find the cultivation method any more complicated than the standard method. When the plants are delivered in August they already have a well-developed first vine. “That load already ensures good generative development and we plant them straight into the holes in the stone wool slabs,” says the grower. “We use extra high slabs, because they support generative growth well.” After 1 January, when the days start to lengthen again, Kouwenhoven continues to promote his crops’ growth. The lighting system can then be used as an extra means of control. “But you do have to beware of your greenhouse becoming too hot if your energy screen is closed,” he concludes. ■



Grower Roland Kouwenhoven to Marc Mens (left): “Without artificial lighting it would be impossible for us to produce all the year round in the Netherlands. Grow lights give us that possibility, and preclude the risk of our customers resorting to other suppliers.”

# The Partnership

news and views from Enza Zaden

next  
edition

The next edition of the Partnership will appear in September 2015.

Markets:  
Africa

Products:  
Lettuce

Science:  
Seed Technology

CSR:  
Energy neutral buildings



## Colophon

The Partnership is published by Enza Zaden.

Editing, concept & layout  
Enza Zaden, Communications department.

Pictures  
Pieter Prins Fotografie, The Netherlands;  
Jan van Staalduinen, The Netherlands;  
Shutterstock, Inc. USA; Enza Zaden.

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Enkhuizen | The Netherlands

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# the power of healthy food

How can we continue to develop vegetable varieties that contribute towards healthy, varied food?

This is one of the topics we deal with on a daily basis at Enza Zaden. Our aim is to grant everyone everywhere in the world access to healthy, varied vegetables. And to ensure that our vegetable varieties meet the specific requirements of local markets, including the requirements and needs of local consumers and growers.

We will continue to invest significantly in technology and cooperation with other parties. By strengthening the expertise and experience within the chain we realise optimum results from innovative genetics and advanced cultivation techniques. This enables us to jointly arrive at the best structural, sustainable solutions to the global food issue.

the power of healthy food  
the power of Enza Zaden



ENZA ZADEN



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4-6 February 2015  
Hall 1.2  
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