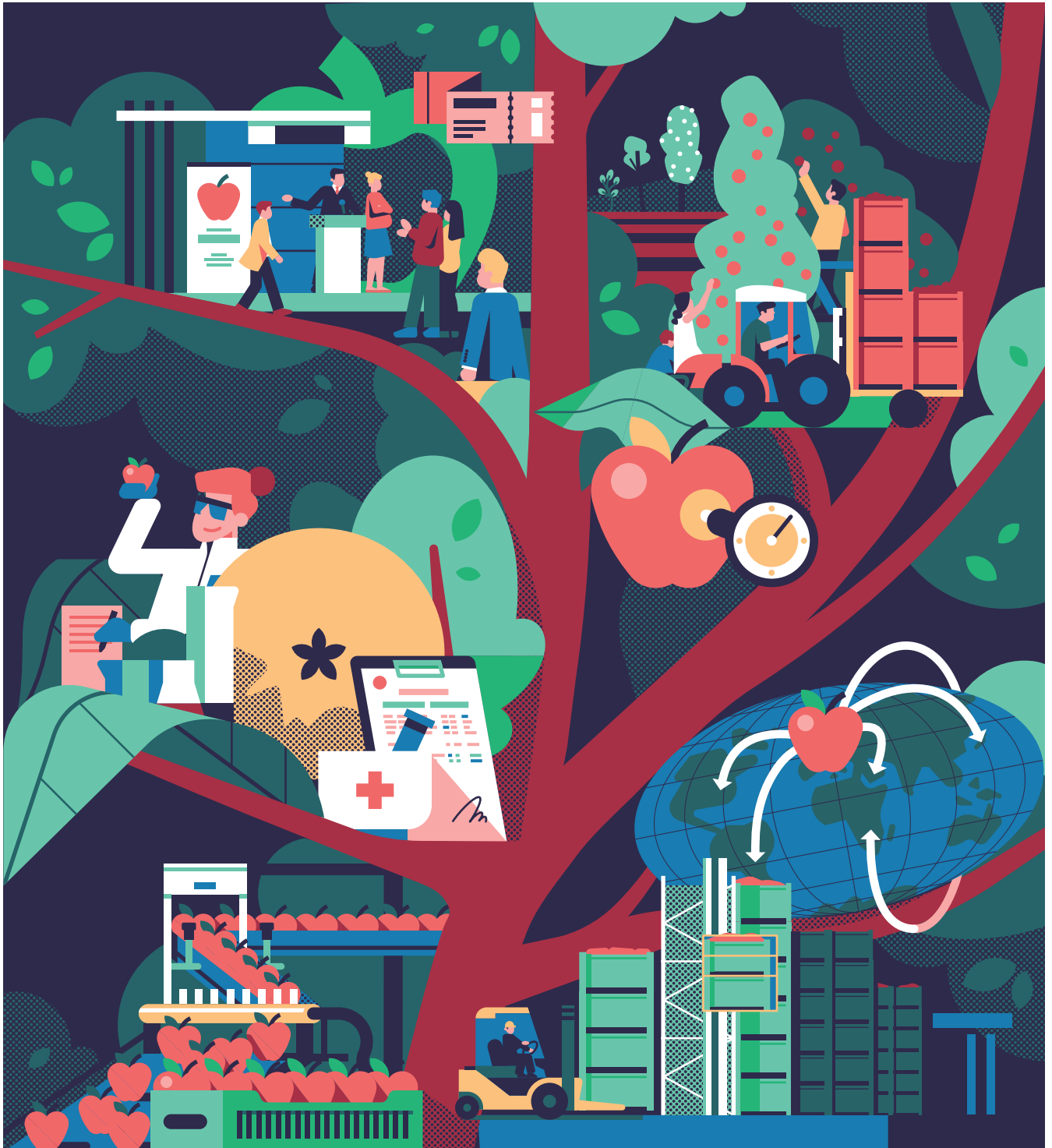


# ipóma

Apple Journeys Impressions — Health Research Lab Visit  
Forthright Farmer Interview — In Search of the New Profile  
Looking Ahead Report — Back to Their Roots Interview



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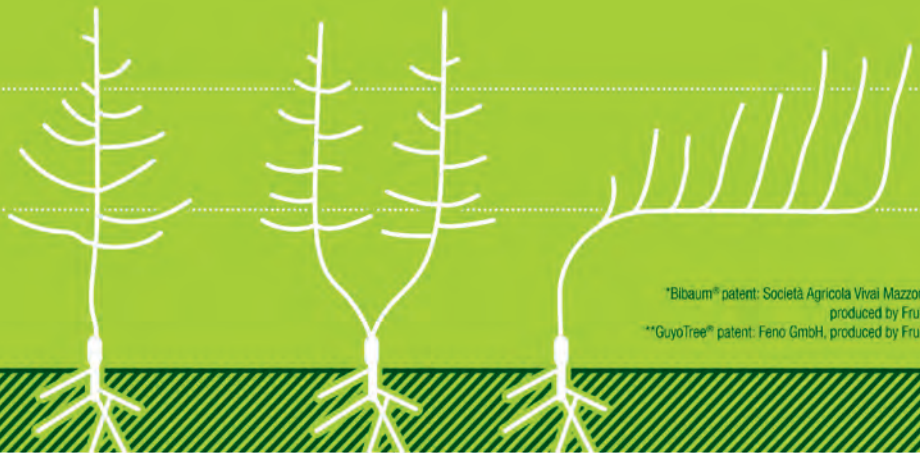


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# Welcome

## Dear readers,

These fast-moving times have brought about many changes at Interpoma, the world's only trade fair dedicated exclusively to the apple economy. But every crisis creates opportunities. This year's fair comes to you in a new, hybrid form, with the digital event Interpoma Connects 2020 – Digital Days for the Apple Economy; the Interpoma Congress taking place online and offline; the Interpoma Future Hub for innovative start-ups; and new formats such as Interpoma Business Match, a virtual matchmaking platform. All new, all exciting! Just like the magazine you have before you: **ipoma**, the official magazine of Interpoma, dives deep into the apple industry's issues of the day.

The changes taking place in the world are affecting our industry too. So one of the big stories in this first issue addresses the question that is currently on everyone's lips: Where to next for the apple industry? The answers may be found in the following pages: exciting research approaches, plenty of examples of best practice, as well as current challenges like variety innovations and sustainability. The keynote speaker of the Interpoma Congress, Willi Kremer-Schillings, provides food for thought for consumers and farmers. And last but not least, we take you on a journey to the origin of the apple in Kazakhstan.

**Interpoma as we know it will take place again on November 4-6, 2021. In the meantime, we hope you find this magazine an interesting and stimulating read! The ipoma team**



### 100% Apple

**This magazine is printed entirely on apple paper – paper made out of waste from apple juice production. That's how versatile the apple is.**

**Do you have any suggestions, ideas or feedback?**

**Get in touch at [interpoma@fieramesse.com](mailto:interpoma@fieramesse.com)**

From Our Editors



— Number of apples the editorial team ate while producing the magazine.



— Number of apples eaten by copy editor Silvia alone (favorite variety: Fuji). A record!



— Number of times the word "apple" appears in this issue. 180 times in the singular, 95 times in the plural.

The Dolomites.  
My Homeland.  
My Apple Gin.



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# Features



## The Apple's Journey

Measured, washed, put into hibernation. A journey in pictures. — [06](#)



## Apple Therapy

How healthy are apples? Can they be used for therapeutic purposes? A lab visit. — [18](#)



## The Forthright Farmer

Willi Kremer-Schillings on food for thought, provocations, and the self-deception of the do-gooder. — [24](#)



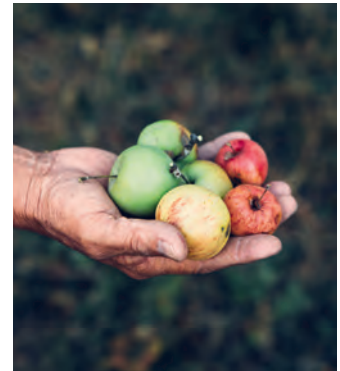
## The Scout

The man who travels the world to constantly discover new, promising varieties. — [30](#)



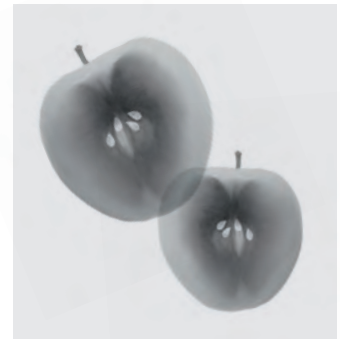
## Future-proofing the Apple

Growers worldwide face the challenge of rekindling the appeal of the apple. We look ahead. — [34](#)



## Back to Their Roots

Discovering the birthplace of the apple in Kazakhstan's Tien Shan region. — [46](#)



## The Apple Bares Its Soul

A scanner that shows: it's the inner values that count. — [50](#)

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# The Apple's Journey

It is tested and measured, photographed from all angles, washed, and put into hibernation before finally ending up in the consumer's hand. *The apple's tale.*

## 01

It all starts with a vision in pink and white: every spring, the 160 billion or so South Tyrolean apple blossoms attract winged visitors galore – bumblebees, wild bees, honeybees. Each one is important to farmer and apple alike, especially the honeybee. Every year, around 300 million bees give South Tyrolean farmers a vital helping hand by pollinating the blossom to enable the fruit to form.

08

Photo Report ipoma



02

Fighting the frost: after World War II, the fruit grower Blasius Höller built his own frost protection spraying system using makeshift components to supply the water, like cartridge cases from anti-aircraft guns. In late April 1950, Höller managed to save his Morgenduft harvest by spraying the trees – and frost protection spraying was born.



03

Finally, it's harvest time: an Indian farmer in the Kashmir region sorts freshly picked apples. The region puts 1.2 million tons on the market annually, in 113 different varieties.



04

It's the inner values that count: one way to find out exactly when an apple is ready for harvesting is the starch iodine test. The starch granules on the surface of the cut fruit are dyed with a solution of iodine and potassium iodide and the pattern is assessed against an index. The darker the color, the more starch the fruit contains and the less ripe it is.





05

A refrigerated warehouse in Sparta, a small town of 4,000 inhabitants in Michigan. In this US state, around 9 million apple trees are grown on almost 15,000 hectares of land. Some 850 farming families work in the apple business.

09

High-tech hibernation: once the apples are pre-sorted – by size, color, shape and firmness – they are stored in high-bay warehouses (shown here) or put into temporary storage. They don't see the light of day again until a buyer orders them. Then the crates are brought out of storage and the apples are sent for grading.



06



07

In the photo booth: as each apple passes through the grading system, it is photographed in an imaging chamber 60 times in just a few seconds. A computer program selects and grades apples of the same size, color, and quality.

The South Tyrolean apple goes global: with a market share of around 40 percent, Italy is still the main market for South Tyrolean apples. But another major market that has been growing for many years is the Middle East and North Africa – the picture shows a dealer in Dubai.

08



---

10

Photo Report **ipoma**

09

Take a bite! In South Tyrol, around 20 varieties are commercially grown and marketed; it is estimated that there are over 30,000 different apple varieties worldwide.



ipoma



**Apple production in China rose by 70.6 percent in 10 years: from 26 million tons in 2006 to 44 million in 2016. The other fastest growing apple producing nations: India (+58.3%) and Poland (+56.4%)**

Source Belrose/FAO

# Did You Know...

## STORAGE TECHNOLOGY



## ... that apples are stored in caves in the Val di Non valley?

**Around 30,000 tons:** That's how many apples are stored around 300 meters underground in the Val di Non valley in the Trentino region. With constant temperatures all year round and equipped with state-of-the-art storage technology, these underground chambers are ideal for storing fruit.

Once mined for Dolomite sand by a building company, the caves they created remained unused until Melinda, the fruit growers' consortium in Val di Non and Val di Sole, hit upon the idea of using them for storage. The rock acts as natural thermal insulation, so there's no need to use environmentally harmful cold storage panels or ammonia as a refrigerant. And because the air doesn't have to be cooled, the system also saves energy and water. [www.melinda.it](http://www.melinda.it)

## CULTURE

## ... that apples are a noble gift in Japan?

**In Europe** you give your host a bottle of wine. In Japan you give them an apple. Fruit is considered a luxury product, and enormous effort goes into producing flawless exemplars presented in elaborate packaging. It also comes with a hefty price tag: weighing up to 1 kg, the Sekai-Ichi apple can cost the equivalent of EUR 17.50. And it's not only apples that are popular wedding presents or host gifts: strawberries and melons are, too. Gifts play an important role in Japanese culture and are given all year round to family members and friends, as well as to customers, bosses, and neighbors. A great way to maintain harmony.



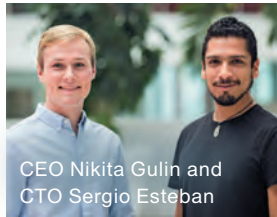
# Innovations

## STARTUP 1 AGROROBOTICA

### Pest Control App

**SpyFly** is a pest monitoring system that combines artificial intelligence with robotics. Powered by solar panels for autonomous operation, the trap attracts and catches pests and identifies them. SpyFly combines the insect info with environmental data. If developments threaten to take a critical turn, the grower is alerted directly via a smartphone app. [www.agrorobotica.it](http://www.agrorobotica.it)

## STARTUP 2 AGRANIMO



**Agranimo** is all about the microclimate. Weather forecasts and satellite and drone images are combined with machine learning algorithms to detect any changes in the soil and the microclimate. This enables the farmer to increase yields, reduce costs, and optimize supply chains. [www.agranimo.com](http://www.agranimo.com)

## STARTUP 3 ODIS SOLUTIONS

### On Tap

**Odis** has been based at the NOI Techpark in Bolzano since August 2020. Three hardware and software developers have designed a smart system for irrigating orchards: sensors measure soil moisture and wet temperature in the fields, and data are sent directly to an app on the grower's smartphone, which can also be used to control the irrigation system. The sensors are easy to install, so the growers can fit them themselves. [www.odisolutions.eu](http://www.odisolutions.eu)

## INTERPOMA AWARD CALL FOR PROJECTS

### New Vigor

**Interpoma zeroes in on innovation.** For the first time, the trade fair will be honoring projects that make a major contribution to renewal in the industry or inject new vigor into apple marketing: the Interpoma Award, a biennial award that will be dedicated to a different theme each time. The theme of the first edition is Variety Innovation, encompassing projects on breeding, new apple varieties, or marketing. A jury of experts will select the winners, who will receive their awards at the next Interpoma (November 4-6, 2021).

**ENTER BY OCTOBER 31, 2021** — Do you have an unusual idea or a promising project? Full details and entry form for the Interpoma Award: [www.interpoma.it](http://www.interpoma.it)



## BREEDING CISGENESIS



Valuable collection: Many old varieties are preserved at the Laimburg Research Center in South Tyrol, providing valuable genetic material for crossbreeding.

## Resistant Apple Varieties

**Apple breeding** is gaining renewed interest the world over, with around 100 programs researching new varieties currently underway. Their emphasis is on resistant apple varieties. The fact that resistant varieties need less spraying and therefore have a smaller environmental footprint chimes with consumers' increasing awareness of sustainability. A promising method of plant breeding is cisgenesis, a process in which only genes from the same or a closely related, cross-compatible species are transferred. A cisgenic apple variety therefore contains no foreign genes, thereby meeting consumer acceptance. In Switzerland, the first field trials are currently underway with cisgenic apple varieties that have been transformed from wild apples with a resistance gene against scab and fire blight.

## EVENTS NEW FORMAT

## Interpoma Goes Digital

**Boost** your business know-how and strike up new business relationships without moving from your desk. That's the theme of the largely digital trade show Interpoma Connects 2020 – Digital Days for the Apple Economy, which takes place on November 19 and 20, 2020. For this year's edition, FieraMesse has developed a new format consisting of three events.

1. The two-day **Interpoma Congress** returns in a new hybrid form. "Most of our speakers over the two days will be attending in person and the number of participants has been reduced, but the entire event will be streamed," explains Gerhard Dichgans, the trade show coordinator.
2. The **Interpoma Future Hub** is a digital platform for promoting international startups and scaleups.
3. The virtual matchmaking platform **Interpoma Business Match**, run by the European Enterprise Network (EEN) and the Bolzano Chamber of Commerce, is the perfect meeting place for businesses and customers. [www.interpoma.it](http://www.interpoma.it)

# Sneakers from... Apples

Hannes Parth has been developing sustainable materials from apple leftovers with his company, Frumat, since 2008. Their AppleSkin apple leather and their apple paper are in high demand.

*Hannes Parth on stage at the Green Carpet Fashion Awards 2018 at La Scala in Milan, where he received the award in the Innovation and Technology category.*

## 01 Why apples and not, say, grapes?

We did try grapes, and sugar cane as well. But the technical properties of apples and their color are ideal for our purposes. The apple is also the only fruit that can be processed all year round because it is always available. Grapes have a relatively short season and are not kept in storage. And besides, South Tyrol has a lot of apples and the product appeals to everyone.

## 02 What is your most exciting project to date?

Can I name three? The designer Philippe Starck has designed a sofa for Cassina, the Italian furniture manufacturer (1), which is upholstered in our AppleSkin apple leather. Tommy Hilfinger has made sneakers from AppleSkin (2). And BMW has developed a backpack line made of apple leather.

## 03 Has the issue of sustainability now reached the luxury labels, too?

Partly. Start-ups and young designers generally like to work with sustainable products and therefore with our materials, and they have no problem communicating that. Long-established companies find it slightly harder. They have often been working with the same materials for decades and tradition is what they are all about. They don't know whether or how to explain this shift towards more sustainability to the public. Some go about it in a different way and first develop a capsule collection with our materials, in other words a smaller collection to test customer reactions.





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Researchers at the *Laimburg* Research Center work with the South Tyrolean Health Service's Department of Dermatology and experts at the University of Innsbruck.

# Apple Therapy

How healthy are apples? Can they be used for therapeutic purposes?

In a project entitled *AppleCare*, researchers at the Laimburg Research Center have been working with dermatologists and the University of Innsbruck to find out whether eating apples can alleviate birch pollen allergy.

By Barbara Bachmann

Photography by Patrick Schwienbacher

Irritated, swollen lips, mouth, and tongue. Coughing and sneezing. Burning, watery, puffy eyes. Fatigue and headaches. The symptoms of birch pollen allergy are as varied as they are unpleasant. Appearing most persistently between March and April, they affect about one in five people in Central Europe. And that number is rising.

But that's where the apple comes in, as a team of researchers from the Laimburg Research Center in South Tyrol have found out in a joint study with the South Tyrolean Health Service's Department of Dermatology, the University of Innsbruck's Institute of Organic Chem-

istry, and the Clinic for Dermatology, Venerology, and Allergology at the Medical University of Innsbruck.

"Some fruits – particularly apples, but also peaches and cherries – and vegetables such as carrots, celery, fennel, as well as nuts contain proteins that are related to the birch pollen allergen. So they can also trigger allergy symptoms," says Dr Thomas Letschka, Head of Applied Genomics and Molecular Biology at the Laimburg Research Center in the south of South Tyrol.

It's a Monday morning in late May 2020 and the thermometer outdoors is already

reading 27°C. Indoors, in the cool laboratory, Letschka is talking about the AppleCare project, in which he was the scientific lead from January 2017 to December 2019. The interdisciplinary team from Austrian Tyrol and Italian South Tyrol used this similarity between birch pollen and apple proteins to develop a natural immunotherapy for birch pollen allergy.

Allergen immunotherapy works by supplying the body with small doses of the allergenic substance which are gradually increased until the body becomes accustomed to the substance and no longer identifies it as foreign. "A birch

# “Our aim is to boost the appeal of the apple.”

Walter Guerra, *Laimburg Research Center*

pollen allergy can be alleviated by eating apples,” the molecular biologist says. According to Letschka, who is himself an allergy sufferer, the therapy has numerous advantages: “The subjects were able to eat apples again for the first time in years. And they suffered far fewer symptoms of birch pollen allergy the following spring.” Because of the small number of subjects involved, the project should be seen as a preliminary study, he notes, adding that they are planning to extend it to hundreds of people.

With projects such as *AppleCare*, the Laimburg researchers are aiming to scientifically substantiate the well-known adage, “An apple a day keeps the doctor away”. “We are simply not taking the conventional wisdom of apples being healthy as read,” says Walter Guerra, head of the Pomology Research Group at the research center. A lot of research has already been conducted on the apple, but there is still a lot more to be done, especially in respect of health claims.

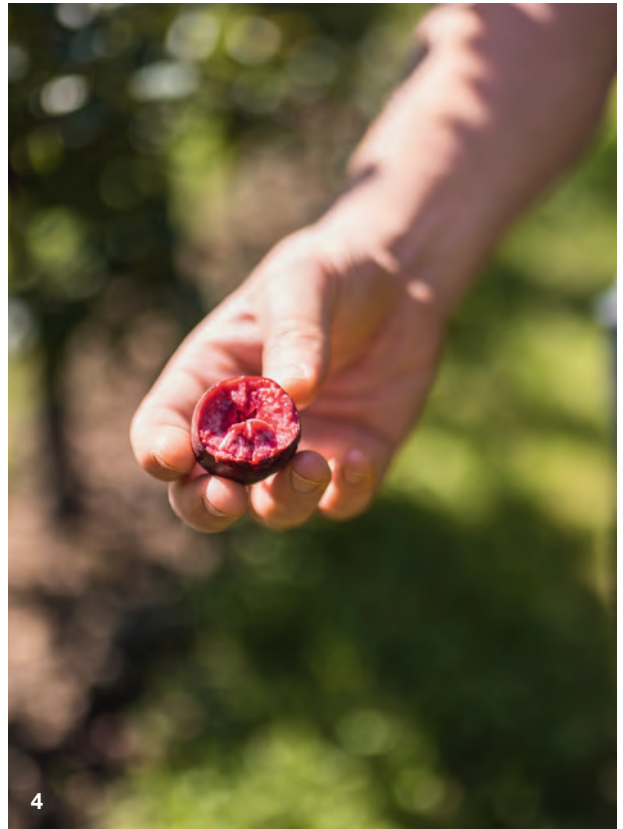
Rich in fiber and vitamin C and with a natural laxative effect, the apple, Guerra says, has become a staple food because of its nutrients, its excellent keeping qualities, and the fact that it can be eaten raw. Apples are consumed in much larger quantities than berries, for example. Average apple consumption in Italy is around 20 kilograms per person per year, although the numbers are tailing off slightly. “We are aiming to maintain or even boost consumption and the appeal of the apple,” he says.

As he talks about the benefits of the apple, Walter Guerra is standing among some of the apple trees in the Laimburg trial orchard. Varieties that are not yet available on the market have been trialed here for the past 40 years. At present they have 300 international varieties, 120 local heirloom varieties, and 100 from the center’s own breeding program, which has been running for 20 years. Breeding is an undertaking that requires a lot of patience. “It takes at least 20 years from pollination of the blossom to the point when the apple is available for consum-

**1** *Walter Guerra*, Head of the Pomology Working Group at the Laimburg Research Center, which for the past 40 years has been testing varieties that are not yet available on the market.

**2+3** *Thomas Letschka*, Head of Applied Genomics and Molecular Biology at the Laimburg Research Center, would love to expand his research to hundreds of people.

**4** With projects such as *AppleCare*, the Laimburg researchers aim to scientifically substantiate the well-known adage, “An apple a day keeps the doctor away”.



# The red-fleshed apple looks like a completely different fruit.

ers to buy,” Guerra says. The Research Center recently submitted two breeding numbers for EU plant variety rights. A Laimburg-bred apple variety could soon be making an appearance on supermarket shelves.

“The apple has a stronger varietal identity than other fruits such as apricots,” the pomologist says. Consumers can generally recognize different varieties. “The fascinating thing about the apple is its great diversity. We can select from it for specific uses, such as apple therapy to alleviate birch pollen allergy.”

The AppleCare project, which was funded by the European Regional Development Fund (ERDF) and the Interreg V-A Italy-Austria program with a total budget of around EUR 800,000, recruited people from Tyrol and South Tyrol with an apple and birch pollen allergy. Skin and allergy tests were carried out on 60 volunteers in hospitals in Bolzano and Innsbruck. Twenty-two finally took part in the one-year apple therapy trial.

Besides recruiting patients, the first steps also involved identifying suitable apple varieties, Thomas Letschka explains. “Altogether we analyzed 23 different apple varieties, including market varieties, old local apples, and some new ones.” After numerous laboratory trials and clinical tests, the researchers settled on three varieties. The first was the red-fleshed variety RM-1, marketed under the brand name Red Moon. Depending on their individual tolerance level, every day for three months the subjects ate anything from a few pieces to a whole apple of this variety, which is classified as very mildly allergenic.

Over the following three months they consumed the moderately allergenic variety Cripps Pink (Pink Lady), well-known for its pink skin and juicy, sweet, slightly acid taste. The third apple was the popular yellow-skinned, sweet, aromatic Golden Delicious. The subjects ate this variety, the most highly allergenic of the three, for the last six months of the trial.

“In the chemical part of the project, the researchers looked at the structure of the allergens,” Thomas Letschka explains. In the molecular biology part, he and his colleagues investigated the apples at the genetic level. “We asked ourselves questions like: What allergens are there in the genetic make-up of the apple and how often are they produced? Are they the same in all varieties? How active are the genes?” Among other things, the researchers discovered that the quantity of allergens is not only determined by the variety but also by how the apple is stored. But the quantity of allergens an apple contains is not the only reason why this fruit can trigger allergic reactions.

The apples the project revealed as being the most easily tolerated and least allergenic are the ones Walter Guerra is standing in front of in the Laimburg trial orchard. The leaves of their trees shimmer with reddish tones. He picks an apple and bites into it. It is not quite ready to be harvested, but you can already see its red flesh. “The red coloration comes from anthocyanins,” Guerra explains. Anthocyanins are regarded as having anti-inflammatory and vasoprotective properties. They bind free radicals and protect the DNA, lipids, and carbohydrates from damage.

A red-fleshed apple is unusual; at first glance a lay person may not even recognize it as an apple. In some countries this variety has been on the market in small quantities for several years now, under the umbrella brands Kissabel, Red Moon, and Red-love. Some retailers would like to market it as a superfood because of its health-promoting properties, which are said to surpass those of a normal apple, Guerra says. Red-fleshed varieties are the new trend in the apple industry. **BB**

In the chemical part of the project, the researchers investigated the structure of the allergens.



# The

# Forthright

*Willi Kremer-Schillings*, better known as Farmer Willi, provides food for thought on being provocative, the self-deception of the do-gooder, and how society and agriculture can understand each other better.

**Interview by** Christian Heinrich

**Photography by** Silvia Reimann, AK, unsplash/Zoe Schaeffer

# Farmer



**1** Much has changed in agriculture over the past decades. Willi Kremer-Schillings is convinced the message isn't getting across to the consumer.

**2** The 66-year-old farmer from Rommerskirchen near Cologne doesn't mince his words. In fact sometimes he's downright provocative – but just to kick-start debate, he says.

**Mr. Kremer-Schillings, five years ago you published an angry open letter to consumers which pulls no punches. It starts with the words: “I’ve had it up to here today...”**

You're right, I didn't exactly mince my words and I was pretty tough on consumers in some paragraphs. But I think sometimes you have to be a bit provocative to get your point across. I wanted to kick-start a dialogue, a new understanding between agriculture and society. And to do that I had to be direct – and tell the truth.

#### **What truth?**

Over the past few decades, so much has changed in all areas of agriculture. But we haven't been very good at getting that message across to consumers, so the changes have largely gone unnoticed. After the Second World War, people only got to eat meat once a week on Sundays. Agriculture has swept aside these kinds of shortages, with farmers falling over themselves to produce more and more.



## “A lot of people mean well, but they tend to prefer bargain-hunting to changing the world.”

Willi Kremer-Schillings, *farmer*

And farms have changed too. When I was young, our family farm had 17 cows, a few pigs, and a few chickens. Then farmers started specializing because they realized they could produce more that way. We concentrated on chickens, for example: 4,000 birds, cage-reared, lots of automation.

### **Cage-rearing was banned in 2010, though.**

Yes, and that was what society wanted. But even then, the message was: look at what awful things those farmers have done. No one stopped to think that they were doing it to meet demand. People are often very quick to jump to conclusions and condemnations on agricultural practices without understanding the context at all. Take apples, for example...

### **By all means.**

Some growers spray their apples 30 times a season. When I tell people that, they immediately say: what, 30 times, that's crazy – I'm not eating those! And yet this number on its own is meaningless. These farmers might be using a natural product that has to be applied multiple times. That's often the case in organic farming. As far as chickens are concerned, a lot of people think the animals spend their lives in green meadows. But without intensive or “factory” farming you could never produce the number of eggs that consumers and industry want, and at the prices they are prepared to pay.

### **That sounds like you're justifying avoiding organic farming on a grand scale.**

Not at all. I'm very much in favor of organic farming. I only ever buy organic pasture-raised milk myself, even though it's more expensive, because I believe in it and because it tastes better too. With apples, prices are a lot higher for organic – anything up to 70 or 80 percent more. But fortunately, plenty of people are willing to buy them. Consumers are also happy

to pay a higher price for organic eggs. Although it has to be said that a large proportion of eggs are still produced by chickens that never see the light of day, and the industry is maintaining its price pressure in this segment. But in other areas such as meat, higher prices won't wash with the consumer. People want organic and cheap – but that's just not possible.

### **Aren't a lot of consumers willing to pay higher prices for organic apples, meat, and eggs these days?**

Organic is gaining ground, for sure, but only very gradually. In absolute terms, organic farming only accounts for a tiny proportion of agriculture so far. I know of farms that have converted to organic but have struggled to find buyers. Organic is a popular subject with the media, but it figures much less in consumers' buying decisions. Osnabrück University of Applied Sciences did an interesting study on this. They went and stood outside a supermarket and asked people going inside how they normally shop. Organic and regional, a lot of them said. When they came back out, the researchers asked if they could look in their shopping carts. Only 16 percent had actually bought what they said they were going to buy.

### **So the consumers were lying to themselves.**

Yes, but not on purpose. A lot of people mean well, but when push comes to shove, they tend to prefer bargain-hunting to changing the world. And with meat, the price differential is enormous: a conventional chicken costs EUR 2.79, whereas an organic one can cost as much as EUR 24.99. The fact that you can buy a whole chicken for less than three euros means that even people on low incomes can eat meat regularly. So even a pensioner on a basic state pension can afford to cook up a pot of chicken soup – it's social justice, really. On the other hand, it has to be said clearly that anyone who buys a whole chicken for 2.79 forfeits the right to complain about factory farming at the supermarket checkout.

### **So it's consumer demand that determines which types of food are produced?**

That's a crucial point: the biggest ballot box in the world is the scanner at the supermarket checkout. Consumers are the voters, and they get what they vote for. It started back in the 1950s when people wanted to eat meat more often than just their Sunday roast, once a week. And these days, not many people are prepared to spend a lot of money on food. When I buy a jar of pickles from India at Lidl, Lidl orders them again. Every purchase we make is an instruction to make the same product in exactly the same way again. I don't want to pass

on all the blame to the consumer, but then the consumer can't shift all the responsibility onto agriculture either. What we need to do is to find a good avenue to go down together in the future. And for this to happen, we need to have a dialogue.

#### **What form could that take?**

Agriculture is an essential service, there's no question. It produces what we put into our bodies. So it needs care and attention, and that's something people need to become more aware of. And we – the farmers – also need to play a part in that. In Cologne dialogue we say: *Arsch huh, Zäng ussenander* [backside up, teeth apart], which basically means we need to stand up and speak out. We farmers must shine the spotlight on the issues confronting us at all levels.

#### **Can you be a little more specific?**

Sometimes a group of kindergarten children passes by my farm. Once I said to them, come on in and I'll show you our machines and tell you what wheat is made into. After

fifteen minutes they were exhausted, but now they have that knowledge.

#### **That's all very well, but does it really have any effect?**

It represents the beginning of a dialogue – even among very young children. It starts forging connections in a very subtle way. There should be much more of this going on, so that we can promote a new, more realistic understanding of agriculture. I always say to my colleagues: Get involved! Go into

Agriculture produces what we put into our stomachs, Kremer-Schillings says. So it needs careful nurturing, and that's something people need to become more aware of.



## “If you care about the climate, don’t buy apples from the other side of the world.”

Willi Kremer-Schillings, *author*

local politics, say yes to research requests from universities, play an active role in your region. Initiate new projects, including on your own farm; get creative.

### What can society do to better understand farmers, to see things from their perspective?

First off, have the patience to listen. That goes for everyone, by the way. The Austrian philosopher Paul Watzlawick once said, “The dissenter is not stupid, he has just constructed a different reality.” And people need to get to know that reality. If someone is shocked to hear that some apples are sprayed 30 times per season, then as a farmer I should be saying: I understand why your initial reaction is to criticize my production methods, but please let me explain the contexts.

### What role should the retail trade be playing?

Supermarkets have a lot of leeway in their dealings with farmers. But that also means they bear responsibility. They can put pressure on a farmer to lower his prices, but they can also make a conscious decision to support local farmers, take that pressure off them, and build up solid, long-term relationships with them. An acquaintance of mine keeps his pigs in a conventional but animal-welfare-friendly way. His pork doesn’t cost the usual EUR 1.60 per kilogram but EUR 1.85. His local supermarket only stocks his meat and the customers buy it. If there was cheaper meat on offer in the freezer section right next to his, the more animal-welfare-friendly version probably wouldn’t sell so well. But the local supermarket believes in supporting regional producers, and it works. Local is better in many ways. And that’s something consumers who buy organic often underestimate. Some supermarkets source their organic carrots from Israel in winter. And as for apples – there are plenty growing in Central Europe! So I say: if you care about the climate, don’t buy carrots and apples from the other side of the world!

### What about policymakers? How can they help to bring society and agriculture together?

Policymakers can and should exercise a certain degree of control, but they should also make sure no one suffers in the process. Take environmental protection, for example. If we expect farmers to do more to protect nature and diversity, they can do that, of course. But they need to be paid for it.

### So the government needs to come up with the money to intervene in a regulatory capacity.

### Assuming it did, wouldn’t it be a good idea to ban factory farming while they’re at it?

That’s a possibility, of course – once the matter of what factory farming actually means has been cleared up. But it’s not that simple. That pensioner may not be able to afford her chicken any more, and we would end up with a two-tier society in which meat eating is the preserve of the better-off. And as long as intensive farming is not banned worldwide, cheap meat would simply be imported from Spain, Denmark or the Netherlands. I don’t think all-out bans are the way to go. The consumer must lead the way. Because ultimately consumers are the ones who will decide the future of agriculture. **CH**

*Willi Kremer-Schillings (66), keynote speaker at the 2020 Interpoma Congress, is a farmer from Rommerskirchen near Cologne, Germany. He obtained a PhD on crop production in 1981 and subsequently worked in industry. Now retired, Kremer-Schillings spends his time writing and doing PR work. He rose to prominence in Germany in 2015 with his “Letter to Consumers”, in which he complained about the lack of appreciation of farmers. The letter caused a media stir around the world. His book on the same subject, *Sauerei! Bauer Willi über billige Lebensmittel und unsere Macht als Verbraucher* [Disgraceful! Farmer Willi on cheap food and our power as consumers] was published in 2016. You can read his “Letter to Consumers” and other musings (in German) on his website: [www.bauerwilli.com](http://www.bauerwilli.com)*



## THE COLOURS OF **OUR HARVEST**

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*Markus Bradlwarter* has been general manager of the South Tyrol Variety Innovation Consortium (SK Südtirol) since 2011. Established in 2002 as a joint venture between the cooperatives VOG and VIP, the SK's mission is to search all over the globe for new varieties in order to test their suitability for cultivation in South Tyrol.

# The Scout

*Markus Bradlwarter*, general manager of the Variety Innovation Consortium South Tyrol, travels the world to seek out the most promising varieties and tells his story here.

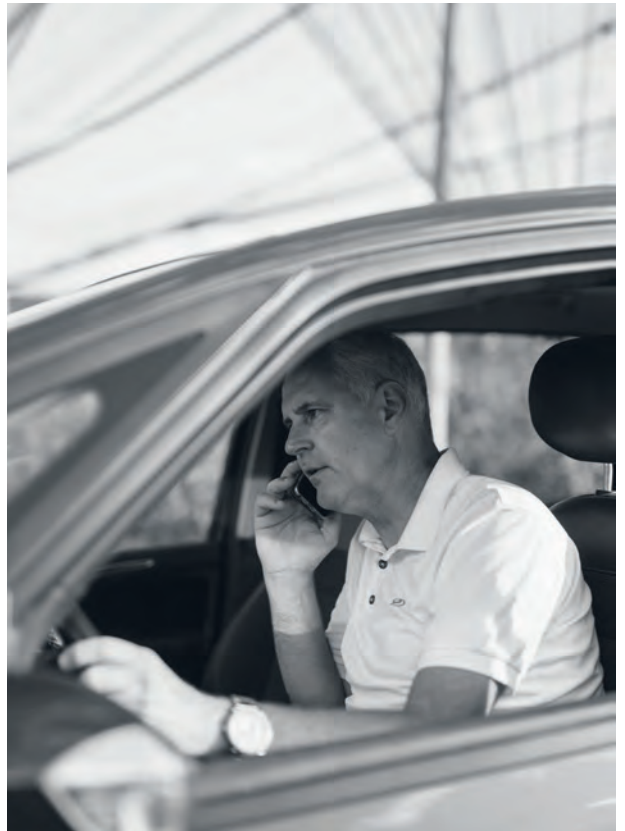
As told to Silvia Oberrauch  
Photography by Patrick Schwienbacher

“Before the Variety Innovation Consortium South Tyrol was set up, we didn't have a clear picture of who was growing which apples where in the world or who was managing which varieties. Today we are in touch with breeders and managers all over the world: we visit them or invite them here. We can't just sit here and wait for new varieties to arrive. The competition never sleeps. Sometimes I feel like a football scout in search of the next big talent.

For example, there is a breeder in the United States we have been working successfully with for many years. He has visited us many times and knows our region and the conditions here very well. He said: You know what, why don't you

come over every year at the end of October, and I'll show you all the varieties that could have potential for you. Then we can taste our way through them together. We've been tasting apples together ever since – often the same variety several times over. Was this apple this good last year too? Does it taste as good this year? That's something that can also happen in breeding: an apple can be really good one year and taste of nothing very much the following year.

If we like an apple, we start off by importing the scion. Before the scion is exported, it often goes into quarantine where it undergoes rigorous testing. That means it can take anything up to a year before it actually arrives in Europe.



# Varieties must bear regularly. Otherwise farmers can't make a living.

Once it arrives here in South Tyrol, the scion is sent to another quarantine station in Laimburg, the leading agricultural research center in South Tyrol, where the first trees are bred from it. Every scion can carry pests and diseases so it is vital to make sure they don't introduce any. After about a year the first trial trees will have grown and will be planted out. It's only at this point that we can start observing how the tree behaves as it grows. Then we have to wait another two years until it bears its first fruit to see whether the apple we liked so much abroad also does well in our conditions.

We look at the shape, size, and color of the apple over several years. The color is often a problem. When the tree is young the apples are nicely exposed to the light and turn red, but as the tree grows the leaves cast more shadow and the fruits may take on little or no color. Club varieties in particular need to achieve a certain minimum percentage of color. If we don't get the quality, we can't market the apple as a branded product.

One killer criterion is yield. The varieties must bear regularly over many years, otherwise the farmer can't make a living out of them. Another important factor is whether the apple matures at roughly the same time as Braeburn, Gala or Fuji, or not. It's difficult for farmers to harvest several varieties at the same time: they need to be able to work in succession.

The most exciting moment is the harvest. At this point we don't yet know when the right time is, as it varies depending on the climate zone. So we carry out ripeness tests over three to five weeks, during which we monitor firmness, acidity, sugar, and starch content. Then we harvest, but not all the fruit: we leave some apples on the tree for another week to see if they turn out even better. Next we put them into storage, all in the same conditions. At the end of November, when all the varieties have been harvested, we do an initial tasting to assess the apple's keeping qualities.

Sometimes we'll discover a problem even when we're on the home stretch: the apple might get bruised and scratched

during transportation and will look unsightly by the time it reaches the consumer. Working with a living product throws up constant surprises – including unpleasant ones – that's just how it is. The farmer wants a robust, easy-to-grow, resistant variety that regularly produces good yields. The marketer not only wants a perfect looking apple, they also want a product that's easy to handle, with optimal storage and post-storage qualities. And the consumer wants the apple to taste good, of course. There are a lot of pieces to the jigsaw, and that's our biggest challenge.” **so**

There are around *100 apple breeding programs* worldwide. Previously mostly state-run, many are now at least partially privatized. A percentage of royalties must be paid to the breeding station and/or the variety manager, generally per tree and per kilogram of apples harvested. There is also an entry fee for a variety project, which varies greatly depending on how well the variety is already established on the market. As a rule, it takes about 15 years from the import of the scion to the launch of the apple on the market. This is how long it takes to fully trial a new variety, although to meet rapidly growing demand, this period now sometimes has to be reduced to about ten years. Between 20 and 30 new varieties from all over the world are tested in the stage 1 variety trials at the Laimburg Research Center every year. Of these, just one variety on average enters the Variety Innovation Consortium's second trial phase.



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# Future- proofing the Apple

The apple industry has a long tradition in South Tyrol - one that is based on constant change. Just as they have done in the past, growers in the 21st century are tackling the challenge of how to rekindle the appeal of the apple. *A look ahead.*

By Susanne Pitro

Photography by Patrick Schwienbacher



# “Agriculture has survived to this day because it has constantly reinvented itself.”

Andreas Rottensteiner, farmer, Pieracherhof in Signato, Italy

For anyone setting out to explore the future of the South Tyrolean apple, the Pieracher farm in Signato is a good place to start. In a picture postcard landscape some 800 meters above sea level and with South Tyrol's capital city at their feet, apples are ripening across six hectares of terraced orchards. Some of these varieties haven't yet made it to the retail shelves due to the small quantities harvested, but already carry tempting brand names like SweeTango. “They are quite time-consuming to harvest because you have to cut the stalk off each apple to stop it piercing any others,” explains farmer Andreas Rottensteiner, pointing to the still-immature small red fruits. “But in terms of taste and consistency, they are premium apples. You just can't get better than these – so I'm hoping the price will reflect the extra work they involve.”

The farmer's family has run the farm on the Renon mountain above Bolzano for 260 years. Rottensteiner has always secured the farm's future with innovation: by gradually replacing hay meadows with apple orchards, by pioneering drip irrigation and hail nets, and indeed by growing club varieties. A member of the Association of South Tyrolean Fruit Cooperatives (VOG), the farm started trialing Kanzi in 2003. Today, 60 percent of its acreage is planted with proprietary varieties: Envy, Yello, SweeTango, and, this year for the first time, Cosmic Crisp. This apple – bred at Washington State University in Wenatchee, right at the heart of America's largest apple growing region – was hailed by the New York Times as “the most promising and important apple of the future” after making its debut in the US. “Agriculture has survived to this day because it has constantly reinvented itself,” Andreas Rottensteiner believes. “So the biggest mistake you can make is to do nothing and always stick with the same variety.”

**1** Farmer *Andreas Rottensteiner* at his Pieracherhof farm in Signato 800 m above sea level.

**2** The view from Signato stretches way down into the valley beyond the South Tyrolean capital Bolzano.

**3** Rottensteiner grows six hectares of apples, some of which are not yet sold commercially.

**4** The farm on the Renon mountain has been in the family for 260 years.

**5** Time and again, the Rottensteiners have preserved their heritage with pioneering work and innovation. They replaced hay meadows with apple orchards and were early adopters of drip irrigation, hail nets, and club apples.





**1** South Tyrol seeks to maintain its market position with variety innovation, natural production methods, technological leadership, and unrivaled service.

**2** Around 90 percent of *VOG apples* are grown to Integrated Production standards, with 10 percent produced organically.

**3** *Walter Pardatscher*, director of the largest apple marketing organization, *VOG*.

Even more so when competition from low-wage countries floods the market with traditional South Tyrolean varieties like Golden Delicious or Gala at bargain-basement prices. “In good years, when you get apples being sold by the truckload at 30 cents per kilo, traditional growing regions really feel the pressure,” says Alessandro Dalpiaz, director of Assomela, the umbrella organization of Italian apple producers. That’s particularly true in an area like South Tyrol, where small family farms with high production costs predominate. On top of this, there’s the growing problem of the traditional apple looking increasingly old-fashioned against the ever-expanding range of new and exotic products on display in supermarket fruit aisles.

So how does Europe’s largest contiguous apple-producing region plan to maintain its market position in the face of these developments? By continuing to produce top quality apples, say the large South Tyrolean producer associations, the

above-mentioned *VOG* and the Val Venosta Fruit and Vegetable Producers’ Association (*VIP*). But they can’t keep this promise by resting on the laurels of good climatic production conditions. Variety innovation, natural production methods, technological leadership, and unrivalled service are the key to securing the future of over 7,000 apple farmers across the province.

The *VOG* and the *VIP* may not always share the same focus. But when it comes to issues such as innovating the product range, they speak with one voice, and have done ever since a joint R&D department was set up 18 years ago: the Variety Innovation Consortium South Tyrol (*SK Südtirol*). Back then, the meteoric rise of Pink Lady made it abundantly clear that alongside the standard varieties, a new market was emerging – a market for managed varieties, whose variety and trademark rights are in the hands of private companies or consortia. In return for higher tree prices and royalties, growers

# “It’s not just about sweet or sour, but how well an apple stays fresh.”

Walter Pardatscher, VOG Director



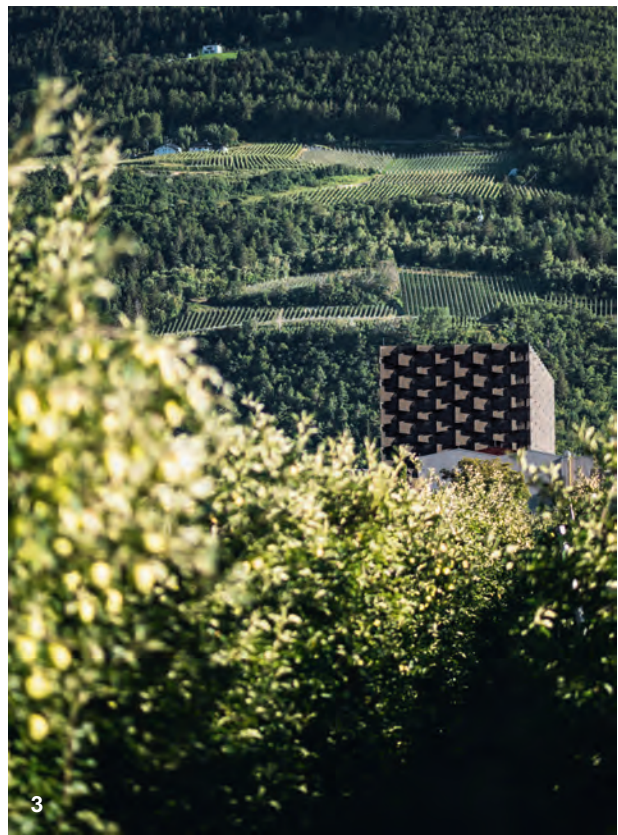
are granted cultivation rights and, along with them, the hope of achieving better farm gate prices in the future through controlled cultivation and exclusive marketing rights. At the same time, these new apple varieties are notable for their special organoleptic characteristics, ranging from ultra-crisp flesh and completely new flavor notes to excellent shelf-life qualities.

About a dozen of these club brands have been introduced in South Tyrol since the SK was founded in 2002. In 2011 cooperation within the region was ramped up a notch through membership in the International Pome Fruit Alliance, in which VOG and VIP work with producer organizations in South Africa, New Zealand, Australia, Chile, and the USA to hunt down the most promising varieties. Three spoils of this hunt will be presented to an international audience in January 2021, including Ipador: an apple with unusually long keeping qualities, making it suitable for marketing in the second half of the season, between March and July. The exclusive rights to Ipador are held by the six members of the International Pome Fruit Alliance, explains SK Executive Director Markus Bradlwarter: “Each member can decide how much to produce in their territory.”

That’s music to the ears of VOG. Europe’s largest apple marketing organization, founded in 1945 – and therefore fresh off celebrating its 75th anniversary – coordinates sales on behalf of twelve cooperatives with around 4,600 farmers producing up to 490,000 tonnes of apples. Of these, 63 percent are exported and have to compete against production and market trends in 60 countries worldwide – a challenge that is met with the slogan “Many apples to satisfy many tastes”. Their vision is to be able to offer an apple that is suitable for every European and non-European market 365 days a year using a sophisticated category management system. “It’s not only about consumers’ preferences for sweet or tart, size or color, but also about whether an apple will cope with long shipping times, or keep its freshness intact in a country with a tropical climate and limited logistical infrastructure,” says VOG director Walter Pardatscher.

One focus of the association’s activities is the issue of sustainability. Around 90 percent of its apples are grown according to the guidelines of integrated production, while ten percent are organically produced on 1,000 hectares. With approximately 30,000 tons, VOG is one of the largest producers of organic apples. The association is also working on the constant internationalization of its Marlene brand which was developed in 1995 for the Italian market and can now be found in 25 countries: In Spain, for example, Marlene is one of the best known brands in the fruit and vegetable sector.

New varieties with exciting flavors notes and special qualities are helping VOG to breathe new life into apple consumption. “Biting into an apple needs to be cool again,” Pardatscher says. This will also help South Tyrol’s apple



**1 + 2** Across South Tyrol, growers are outcompeting each other with sustainable production practices: stone walls, bird nesting boxes, and voluntarily giving up herbicides.

**3** Organic apples grown in the Venosta Valley are stored at the Juval Fruit Cooperative behind a facade with geometrically woven metal bands.

**4** The new high-bay warehouse has room for 18,000 300-kilogram apple crates.

**5** *Martin Pinzger*, director of the VIP, the Association of Val Venosta Fruit and Vegetable Producers.

**6** The VIP brings together 1,700 family farm members in seven cooperatives that organize sorting, storage, and sales.





## “Consumer behavior is changing, and demand for less plastic is growing.”

Martin Pinzger, *VIP Director*

growers to fine-tune their production to better satisfy world-wide demand. To achieve this, a five-year variety innovation program is under way in which 1,600 hectares – about 15 percent of VOG members’ apple orchards – have been planted with new varieties since 2017. “To maximize the quality of each variety, we give specific growing advice in order to make sure they are grown in the right microclimate zones, at altitudes ranging from 200 to 1,000 meters above sea level,” Pardatscher says.

An interesting microclimate can be found in the Venosta Valley in the west of South Tyrol, as well. At between 500 and 1,000 meters above sea level, this is the highest-altitude homogeneous growing area in Europe, with lots of sunny days, low rainfall, cool nights, warm days, and a constant breeze: the Venosta wind. In these conditions, even a standard variety such as Golden Delicious scales new heights with an attractive red blush. That’s why the popular high-altitude Golden still accounts for around 60 percent of the 320,000 tonnes of apples harvested by Venosta’s VIP cooperative. This organization, which celebrates its 30th anniversary in 2020, has 1,700 family farm members organised in six apple cooperatives.

All non-ideal Golden Delicious sites in the Venosta Valley and elsewhere in the region are currently being cleared to make space for new varieties. There is also a widespread move towards more natural production methods. Across South Tyrol, growers are outcompeting each other to incorporate sustainable integrated production practices, from installing stone walls, bird nesting boxes, and wildflower strips to voluntarily giving up the use of herbicides, a strategy in which



Venosta Valley growers lead the field. And it's the same picture in organic apples: with 15 percent of the total acreage now organic, South Tyrol's apple farmers top the European league tables for organic produce. This figure leaps to 20 percent in the west of the province – a rising trend that looks set to continue across all South Tyrolean apple orchards, boosted by a sustainability program which is currently being developed in conjunction with agricultural policymakers.

A landmark symbolizing what has been achieved so far can be found in the village of Castelbello in the Venosta Valley. The Juval Fruit Cooperative's cold store houses all the organic apples grown in the Venosta Valley area. Currently, up to 35,000 tonnes are produced, with plans to reach 50,000 tonnes over the next five years. Since 2019, the site also encompasses a high-bay storage system towering 30 meters in height: in the new building, with its striking façade made up of geometrically woven metal bands, apples are temporarily stored in large 300 kilogram bins.

More than 90 percent of apples from the Venosta Valley are now processed in these fully automatic high-bay systems. VIP director Martin Pinzger: "This gives us a competitive edge in terms of quality, turnaround time, and traceability which puts us up there among the top players in Europe in terms of service." Forklift trucks transport the apple bins up and down the five aisles in the warehouse at lightning speed. A tempo the VIP also applies to deliveries: they promise that their apples will be on the retailer's shelves within 24 hours of the order being placed. And they keep their promise, distance to the customer permitting.

The sales market for Venosta Valley apple producers is less expansive than that of VOG. Around half of VIP's apples are sold in Italy, with the rest going to Germany, the Iberian peninsula, Scandinavia, and 50 other markets. Within these regions, Venosta Valley producers have a reputation for reliability, whether as own-brand suppliers to large retail chains or innovative packaging specialists. "Consumer behavior changes all the time, family sizes are shrinking, demand for finished products is on the rise, and at the same time consumers want less plastic," Pinzger says. So the producer association aims for maximum flexibility in the packaging it offers: "As far as that's concerned, we're definitely up there at the highest level in the worldwide apple sector."

The highest level – that's the formula South Tyrol's apple farmers and their cooperatives apply to overcome the challenges of a difficult market. The future of the South Tyro-

lean apple depends on keeping one step ahead of everyone else. Identifying and exploring new avenues and leading the field, whether in terms of quality, variety innovation, service, or technology, are specialties of the South Tyrolean apple industry which enable it to keep reinventing the humble apple over and over. **SP**

**1 + 2** VIP promises to have the apples on retailers' shelves within 24 hours of ordering.

**3** The *future of the apple industry* lies in the hands of new varieties – like SweeTango, pictured here.



# “Big challenge”

Three experts from the global apple industry share their thoughts on the future of the apple, upcoming problems, innovative solutions, and new stimuli.

## Robb Myers, Director of Domestic Sales CMI Orchards, Washington State, USA

The big challenge in the US market is how to keep on selling new varieties in the face of stagnating apple consumption. To make matters worse, the shelf space available for apples is shrinking all the time, and the constant competition from other new products in the fruit segment is fierce. We can only secure our future by using first-class genetic material for all our varieties. There are no standard solutions in sales and marketing; we have to make sure we automate as much as possible and gear our market strategies to the needs of the individual retailers, particularly on digital platforms.



## Alastair Moodie, Chairman Melsetter & Fruitways Groups, Cape Town, South Africa

Here in South Africa, climate change is causing us huge problems, with rising temperatures and too little rain. The increase in protectionism is making it harder for us to access some of our core markets, and because production can be kept in storage for longer we're losing our seasonal north/south advantage. To remain competitive and secure our future, we must invest heavily in developing varieties that are more adapted to the consequences of climate change, including in international alliances, and remain technologically up to date.

## Rowan Little, General Manager Montague Fresh, Melbourne, Australia

In Australia we are faced with two challenges on the supply front: labor shortages and water availability. On the demand front, the fact that more and more Australians are abandoning the apple in favor of other snacks or fruit is a big problem for us. The most successful way to counter that is to keep on producing new, exciting apple varieties. The challenge is to pick the right breeders and develop a marketing strategy that delivers good results. In the medium term, we are also focusing on new technologies and processes across the supply chain. It's only by innovating that we can cut production costs, get our apples to the customer faster and supply exciting products that give the consumer a brand-new taste experience.





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*The apple originates in the Tien Shan mountain region. It spread like wildfire in the primeval forests there.*

# Back to Their Roots

Kurt Werth can't remember a time when he wasn't fascinated by apples. At the end of his career he fulfilled a dream and went to *Kazakhstan* to track down where they came from.

**Interview by** Lenz Koppelstätter

**Photography by** Jewgeni Roppel, Kurt Werth archive

**Mr. Werth, when did your interest in apples first start?**

My father was a cellar master in San Paolo, the wine-producing village where I was born. So I more or less grew up in a wine cellar, but I was always much more interested in the apple orchards down in the valley. I went to agricultural school in San Michele in Trentino and spent the next 30 years at the South Tyrolean Advisory Center for Fruit and Wine Growing. After that I managed the orchards and vineyards of South Tyrol's church estates, and my last job was to coordinate the Variety Innovation Consortium (SK), which is a joint venture of the South Tyrol fruit cooperatives VIP and VOG. That involved tracking down new varieties all over the world, bringing them to South Tyrol, checking plant breeding rights and licenses – all highly complex matters. I have always been fascinated by the huge diversity in apple varieties, and over the past decades we have been able to successfully promote variety innovation in the South Tyrolean apple industry with the help of our international contacts.



*Kurt Werth worked for the South Tyrolean Advisory Center for Fruit and Wine Growing for many years. He traveled to Kazakhstan with apple industry friends.*





#### **How did these international contacts come about?**

In the early stages of my career I happened to be one of the few advisors who spoke English reasonably well, even though I hadn't learnt it at school. In 1977 I was invited to give a talk at the Mecca of fruit research, the East Malling Research Station in the UK. I accepted and spent a whole summer brushing up my English with a private tutor. It was a matter of holding my nose and jumping in – and somehow I got through my talk in my own version of Tyrolean English. That opened the door to the world of international apple experts, and the networking began. During the course of my career I have been to almost every country in the world where apples grow. I have hosted countless foreign experts here in South Tyrol and organized trips abroad for South Tyrolean fruit farmers.

#### **What was it that sparked your journey to discover the origin of the apple?**

Regular pomology doesn't look back, only forwards: new varieties, new technologies. But when you have spent your entire life working with the apple, as I have, you start getting

interested in its history too. You start wondering: Where was the apple born? Where does it actually come from?

#### **What do we know about that?**

The apple as we know it today originates from the Tien Shan mountain region, most of which is in south-eastern Kazakhstan. At some point in the distant past, a wild version of the apple spread out over thousands of hectares of primeval forest. In 1795 the German botanist Johann August Carl Sievers travelled to the then unknown region on behalf of Catherine the Great in search of plants for medicinal use. He discovered the wild apple forests and the species which science later named after him: *Malus sieversii*. Crossed with *Malus orientalis* from the Caucasus, the fruit came to Europe along the Silk Road with nomads – no-one knows exactly when – where it evolved into *Malus domestica*, the cultivated apple we know and love today.

#### **Tell us about your trip to the Tien Shan region.**

I went with four friends from the South Tyrolean apple industry. We had a driver, a cook, and a Kazakh botanist



with us. We were there for two weeks, travelling around in an all-terrain van and by train and also quite a bit on foot. Everything we needed we had with us in our rucksacks. We slept in cabins and did our morning ablutions in streams. It was a real expedition.

### How big is the area?

Originally, these primeval forests must have been nigh on endless. But 90 percent of them – several tens of thousands of hectares – were cleared in the Soviet era. Back then, a Russian botanist, Aymak Djangaliev, spent months on end travelling through the area, selecting and describing different varieties. But his work was a thorn in Moscow's side. He was imprisoned several times and his variety collections were repeatedly destroyed. Fortunately, after the Berlin Wall came down, attitudes changed and nine remote remnants of the primeval forests are now protected. We have explored seven of them.

### And what did you find?

We traversed steppes and salt deserts and finally reached these remote valleys with the last remaining apple forests. We often didn't see another soul for days on end. Everything was just as it was way back in the mists of time; no-one has ever laid a hand on these apple trees. The area is teeming with brown bears: time and again we came across broken branches, scratched tree bark, and bear droppings full of seeds. Each apple contains up to ten seeds: any one of them could give rise to a new variety. In these forests there are millions of trees with millions of different varieties growing alongside blackberries, hawthorn, and hops and all manner of herbaceous plants. All shapes, all colors. Some of the apples are no bigger than a cherry, and some of the trees are more than 20 meters in height.

### What impact did this trip have on you?

For me, it brought everything full circle. For years I had been involved in breeding and developing new varieties, and there I saw what happens to the apple if it is left entirely to nature. Almost everything in the world is documented, but this fascinating diversity is truly mind-boggling. Everything in these forests is still just as nature intended. Organic in its purest form. The apples have scab, spiders, cicadas, moths, viruses – everything we spend time and effort attempting to control with our modern-day plant protection strategies. The wild apple forests of Kazakhstan have nothing to do with fruit growing as we know it. It's all thousands of years away from a Kanzi or a Pink Lady. Seeing all that confirmed to me that for our present-day needs, growing apples without any plant protection would be impossible. We took cuttings

of many of the wild varieties, collected apples, and carried them all around with us. Not entirely without incident, though: in a cabin one night, mice decided to have a go at some of the apples. But we still managed to bring around 150 specimens back to South Tyrol. The propagating material is now at the Laimburg Research Center. The immediate genetic benefit may be minimal, but the botany is fascinating.

### What do these apples taste like?

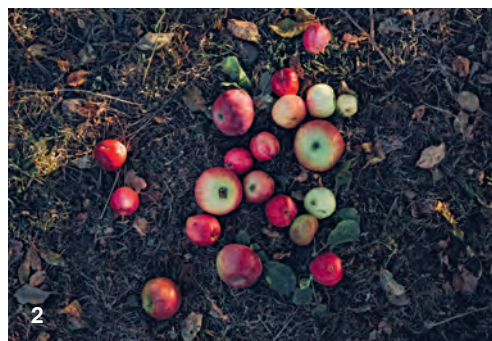
A lot of them are bitter or sour. But bears are real gourmets, so we followed their tracks and found the sweetest varieties. And that confirmed what we suspected: that animals play an important role in varietal propagation of edible fruits.

### Did you encounter the bears themselves?

No, we didn't, luckily. Even though they told us they are relatively tame. And vegetarian. **LK**

**1** At one time, these primeval forests were nigh on endless. Ninety percent of them – tens of thousands of hectares – were cleared in the Soviet era.

**2** Each apple contains up to ten seeds: any one could give rise to a new variety. There are millions of varieties in the area they visited.




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# The Apple Bares Its Soul

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With the apple, too, it's the inner values that count: the quality under the skin is key. The 3D food scanning company Biometric has developed a scanner that sees what is invisible to the human eye.



With its integrated artificial intelligence, the *Q Eye XP scanner* can identify quality defects such as brown marmorated stink bug damage and rot.

**The Interpoma Technology Award** in the Post-Harvest category went to the Q Eye XP from the Bressanone-based company Biometric in 2018. The scanner, which is integrated into the packaging line, detects internal defects in fruits and therefore complements the external quality control. The innovative feature of the scanner is that it uses X-rays that are completely safe for both the user and the product itself. The Q Eye XP is ideal for carrying out a final quality control before the fruit reaches the consumer. It can be integrated directly into the production line and can even be used for incoming goods at retail.

# Planning for Tomorrow

With its “**sustainapple**” strategy and a package of measures for 2030, the South Tyrolean apple sector is working towards a sustainable future – and is pressing ahead with innovation. Nine goals.

## Example

South Tyrol’s sustainably structured agricultural sector should serve as an example: small, intergenerational farms, local and regional associations and cooperatives, cooperation with tourism and other sectors.

## Feeding the World

Producing more than six billion apples per year, South Tyrol’s farmers supply millions of people with high-quality fruit. The sector also wants to promote awareness of good nutrition through educational projects.

## Climate Positive

South Tyrol’s fruit industry should be climate positive, in other words it should bind more CO<sub>2</sub> than is produced by growing and processing apples.

## An Apple a Day ...

Eating apples boosts the immune system and protects against disease. South Tyrolean apples should be profiled as a health-promoting food.

## Healthy Plants

Appropriate use of plant protection methods, establishing beneficial organisms in orchards, technological innovation, and more dialog and knowledge transfer.

## Circular

The macro-region of the Alps should pioneer the circular economy: closing cycles, nurturing soils in a balanced way with organic fertilizers, and wherever possible, avoiding or recycling non-biodegradable materials.

## Innovative Strength

Careful variety breeding, diversity, and technical innovations have shaped the South Tyrolean fruit industry for generations. Now we need to focus even more on health, food safety, and satisfaction.

## Strong Family Ties

Farming families form the bedrock of the South Tyrolean fruit farming sector and should be nurtured and empowered. They should also play a role in social innovation, with projects such as childcare on the farm or training for farm succession purposes.

## Protected Diversity

The fruit industry is committed to improving soil quality, continuing to lead the way in water usage, and maintaining and protecting biodiversity.

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# The Navigator

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With his consultancy firm plenum, sustainability expert Alfred Strigl played a major role in shaping the South Tyrolean apple industry's "sustainapple" strategy. A profile.



**Name:**  
Alfred W. Strigl

**Date of birth:**  
November 28, 1966

**Place of birth:**  
Innsbruck, Austria

**Education:**  
PhD in Bio- and Food Chemistry from Graz University of Technology (1996)

**How I became who I am today:** By working constantly – mostly on myself. Growing up on a farm in Ötztal, Austria, allowed me to experience nature, the mountains, the people at the interface between the traditional and the modern from a very early age. My student days at university in Graz and the years I spent working in Africa, Japan, South America, and Europe were also influential in shaping me. I love the world and people. And for me, people and the earth are one. We are part of nature – and it is part of us.

**My job in brief:** With my deep connection to the world we live in, I help people and organizations on their journey toward the essence of things. What makes sense for the long term? What does the living realm need me to do? What

is a sustainable way forward? The navigator, the companion who guides people in their quest to find the answers – that's us, my team and me.

**What sustainability means to me:** It means permanently embracing life. "I am life that wants to live – in the midst of life that wants to live," is how Albert Schweitzer puts it in his book *Reverence For Life*. Joy, courage and vitality are essential components of sustainability.

**My role model – and why:** My grandfather, Johann Strigl, the *Sautner Kräutermanndl* (the herb guy from Sautens). He introduced me to the vitality, healing powers, and beauty of plants and nature from a very young age. He taught me to smell, to taste, to listen. With heart and soul.

**What I'm proud of:** In every project I work on, I believe everyone is capable of everything right from the start. I love people and I believe we are capable of everything – from destroying the earth to saving the world. What is important is to decide what I want to use my strength, my drive, and my verve for.

**My next project:** In South America, Colombia, I am currently protecting 8,000 hectares of rain forest from destruction with the help of the University of Natural Resources and Life Sciences. I am also working on permanently protecting the same area of forest in Austria – as a kind of twin project. Sustainability here and there. A bold approach is needed everywhere.

**In 30 years the world will be...** as beautiful as it is today.



Running ducks, insect hotels, nesting boxes: *competition winner* Iris Steck has invested a lot of creativity and patience in her apple orchard.

# Love of the Orchard

With various communication measures, the South Tyrolean Apple Consortium aims to bring farmers, residents, and tourism closer together.

“In South Tyrol, apples don’t grow on distant fields thousands of hectares in size but in the heart of the village alongside the neighbor’s garden or along the cycle path that tourists use,” explains Georg Kössler, president of the South Tyrolean Apple Consortium. It’s a situation with conflict potential. “That’s why we want to strengthen the dialogue with non-farming locals and the tourism sector. But also with the farmers themselves, our main ambassadors.”

What happens in an orchard? What kind of work does the farmer do? “We want to get that message across clearly using a series of measures,” says Kössler – for example, information events for hospitality and tourism professionals, family activities with mascots Pauli and Marie, or with the “*Mei liebste Wies*” (My Favorite Orchard) competition.

**The prettiest orchard.** Young farmer Iris Steck from Parcines won the competition in 2019. Her Orchard has a beehive, an insect hotel, a hedgehog house and nesting boxes for bats and birds. Ducks and geese waddle from tree to tree eating pests. “We need fewer pesticides in integrated fruit growing,” Steck explains. Runner-up Thomas Niedermayr from Appiano created a pond in his orchard as a refuge for beneficial insects. The aim of the competition was to show how important biodiversity is to farmers.

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The *Juval Fruit Cooperative's* high-bay warehouse in the Val Venosta valley is controlled by IT and boasts state-of-the-art conveyor technology. Capacity: 18,000 crates.



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# Sleep Tight!

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How do you put apples into hibernation for pre-sale storage? Angelo Zanella of the Laimburg Research Center, lecturer in Post-harvest Management at the University of Bolzano, explains.

## Long Breaths

During storage, apples consume oxygen and release carbon dioxide and water. In Controlled-Atmosphere (CA) warehouses with low temperatures and low oxygen levels, the fruits are put into a form of efficient hibernation to dramatically slow down the ripening process. “Plants can do something that we humans can’t: breathe less,” Angelo Zanella says. This allows apples to age more slowly and stay fresh for longer.

## Pesky Fungus

Zanella is investigating how storage technology can be used to control sooty mold, a fungus that is particularly problematic on organic farms. The apple comes into contact with pathogens in the orchard and the fungus develops in storage – or comes with the apple. “I am currently testing whether the fungus is disrupted by an ionized storage atmosphere or by ozone. I want to keep those beautiful organic apples clean without chemicals, simply by using storage technology.”

## Talking Apples

In DCA (Dynamic Controlled Atmosphere) storage, the apple itself tells us what it needs. “It isn’t us who tell the apple what atmosphere is good for it, but special sensors on the skin that tell us what to do,” Zanella explains. Based on that, the oxygen concentration in the cold store air is continuously and automatically adjusted to the apples’ respiration activity, reducing the risk of disorders such as skin browning as well as improving firmness and extending storage life.

## Negative Stress

Transportation causes the apple far more problems than storage. “We simulate different stages of the apple’s journey and check its condition on arrival in different countries,” Zanella says. In India, for example, apples are sold on the street outside shops, where daytime temperatures can reach 30°C. In the evening they are put back in the refrigerator. “This exposes them to a lot of stress and releases the ripening and stress hormone ethylene,” he continues. Too much of this and a perfect upstream cold chain is worthless.

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# Smart Harvest

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The smartphone app Pixofarm enables growers to produce reliable fruit growth forecasts, optimize harvests, and manage resources.

With autonomous vehicles and machines that communicate with each other, digitalization made its way into agriculture some time ago. The Vienna-based startup Pixofarm goes one step further and uses artificial intelligence, digital imaging technologies, and selected algorithms to produce harvest forecasts.

“The idea came about in 2019. We had been wondering whether the possibilities of digitalization couldn’t be used to replace manual measurements and counts with smartphone technology,” explains Pixofarm CEO Farid Edrisian. Working with a team of ten programmers, big data experts, and artificial intelligence developers, he set himself the goal of making life easier for farmers and cooperatives. The app provides fruit producers with precise, real-time information on fruit growth and harvest volumes, giving them control over their orchards. “It allows them to use resources more efficiently, reduce risks, and take measures to optimize harvests,” Edrisian explains.

The app is based on smartphone images of apples and trees as well as data on the area under cultivation, such as the size and location of the fields and the apple variety. “After each sampling, forecasts are calculated and displayed in real time on the app. This enables users to make informed decisions and optimize processes such as logistics, packaging, and distribution,” Edrisian says. Customers already include producers and cooperatives in Italy, Austria, Germany, Poland, the UK, and the Netherlands.



Taking pictures of fruit and producing forecasts: *Farid Edrisian*, CEO of *Pixofarm*.

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# Products



## PACKAGING

### Disappearing Act

**Sustainable.** Organic apples packaged in an eco-friendly paper tray – and then wrapped in plastic to protect them? That makes no sense at all, the 250 members of the Biosüdtirol organic farmers' cooperative realized. Something innovative was called for. So they came up with a new tray design made of up to 50% dried grass fiber. It holds four apples, protecting them all round yet keeping them neatly displayed. Biosüdtirol has also come up with an alternative to plastic bags. Made of sugar cane and vegetable oils, the new apple bag can be home composted: it breaks down almost entirely within 180 days. [www.biosuedtirol.com](http://www.biosuedtirol.com)

## COOPERATION

### Apple Gin: A First

**New.** Two years of development have gone into KIKU Apple Gin, a cooperation between the Termeno-based Roner distillery and the club variety's South Tyrolean rights holders. With its "honey heart", KIKU is considered the sweetest Fuji variety. The apple forms the basis of the distillate, and the master distiller has reproduced its aroma with various botanicals, including juniper and other classics. The result is a fresh, aromatic London Dry Gin with 42% ABV. It can be drunk neat or with a neutral tonic but pairs perfectly with another South Tyrolean specialty, Tyrol Tonic, which has been specially formulated to go with apple gin. 0.5 l, EUR 38. [www.roner.com](http://www.roner.com)



## RESEARCH

## Best of the Rest

**Healthy.** Skins, cores, and pomace are what is left behind after apples go through industrial processing. In collaboration with the strudel maker Pan, Professor Raffaella Di Cagno (1), microbiologist at the Free University of Bolzano, has developed a powder from these residues (2) that can be added to wheat flour. Bread baked with it is richer in fiber and keeps for longer without the use of chemicals. [www.unibz.it](http://www.unibz.it)



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[info@fieramesse.com](mailto:info@fieramesse.com)

**Project management**  
Maximilian Alber, Evi Götsch,  
Florian Schmittner

**Technical consultant**  
Gerhard Dichgans

**Concept**  
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Lenz Koppelstätter/exlibris

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Valeria Dejaco/exlibris

**Editorial Design & AD**  
Nina Ullrich  
[www.designnomadin.com](http://www.designnomadin.com)

**Editorial team**  
Barbara Bachmann,  
Valeria Dejaco, Christian  
Heinrich, Lenz Koppelstätter,  
Silvia Oberrauch, Susanne  
Pitro, Barbara Tilli

**Photography**  
Bloomberg via Getty/D. Acker,  
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Aleksandar Savić  
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## GASTRONOMY

## Seeing Red

**Exclusive.** The fruit processing company VOG Products has launched a red apple juice in its “Leni’s” consumer line. Red-fleshed varieties give the juice its special color and distinctive flavor profile with pronounced acidity and sweet forest fruit notes. The juice is marketed to the high-end gastronomy sector as the basis for creative cocktails. 0.75 l. [www.lenismele.it](http://www.lenismele.it)

# “Blue apples? Why not!”

New Zealand-based breeding expert Richard Volz works on developing new apple and pear varieties. We spoke to him about the pitfalls of global warming, blue apples and his latest development, ‘HOT84A1’.



**01 You have developed an apple variety that thrives in hot climate zones. Is ‘HOT84A1’ the apple industry’s answer to a warming climate?**

Climate change is something we breeders have always had to deal with. What were cool growing areas yesterday are hot ones today. That brings with it a wide range of problems, such as color development. As breeders, it means we must always take global warming into account in our selection strategy, along with numerous other factors. Getting the right balance has always been – and always will be – our biggest challenge.

**02 How does ‘HOT84A1’ taste?**

Crisp and juicy. Sweet, with subtle honey notes. The flesh isn’t hard, which makes it an easy apple to eat.

**03 Looking ahead to the year 2050, what kind of apples will we be eating?**

That depends very much on whether and to what extent the worldwide market accepts gene-edited apples. Gene editing has the potential to radically change the appearance and taste of the apple, which is something that the conventional breeding method is finding more difficult to do. It’s not beyond the realms of imagination that we will be eating blue apples by 2050. And why not? On the other hand, I think that conventional breeding will still be hugely important when it comes to filling new niches in the market.

**04 What is the most exciting part of your job?**

I really enjoy working collectively on research with lots of colleagues. For breeders there is nothing quite as thrilling as finding a new cultivar with potential.

**05 How many apples do you bite into every day?**

It varies and depends very much on the time of year. But when I am tasting apples, for example to test their storage qualities, it could easily be as many as 50 a day.

*Richard Volz is Science Team Leader of the Pip & Summerfruit Breeding Team at Plant & Food Research (PFR) at Hawke’s Bay Research Center in Havelock North, New Zealand. He has been an apple and pear breeder for 20 years and leads PFR’s pipfruit breeding programs in New Zealand and the Hot Climate Program in Spain.*

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# The World of the South Tyrolean Apple



A glimpse at this detailed illustration illuminates the uniqueness and diversity of South Tyrolean fruit production. Many actors contribute to our success. In South Tyrolean fruit production, all participants work hand in hand in a professional manner. This makes us flexible, adding even more value to our apples, making them something special.

