At the dawn of agriculture in the Fertile Crescent, wheat was domesticated by our ancestors. The earliest farmers collected seeds from useful wild plants and replanted them, resulting in the forebears to the foods we eat today. The wildly expansive list of wheat varieties available – soft, starchy, hard, high gluten, winter and spring – trace the range of our food cultures across the globe. Wheat is one of the most fundamental crops for food security, and a majority of local and regional food systems rely heavily on its production. It is therefore critical to ensure the long-term availability of this crop, which can only be attained by safeguarding its diversity.

Much like other crops still grown today, an original goal of domesticating wheat was to reproduce plants that gave abundant yields. Today, changing weather systems are making agriculture more vulnerable and our food systems more reliant on crop varieties that not only produce high yields, but are also easier on the planet. Such earth-friendly crops can grow with less water, protect soil health and thrive amid changing weather patterns; essentially, they work for both people and the planet. The International Centre for Agriculture Research in Dry Areas (ICARDA) is an organisation undertaking research for the development of such promising crops. Scientist Dr. Filippo Bassi is endeavouring to improve durum wheat in the face of climate change. He highlights that:
The Crop Trust is an international organisation based in Bonn, Germany with the unique global mission to ensure the conservation of crop diversity in genebanks, forever. The Crop Trust, the United Nations Food and Agriculture Organization (FAO) and other partners started the Food Forever Initiative in 2017 to raise awareness on the importance of safeguarding agrobiodiversity to build resilient food systems.

Durum wheat and barley were the pillars that allowed us humans to shift from hunters to settlers and give birth to civilisations. In the time since, we have developed millions of ways of consuming these crops. The flour milling process has seen a countless array of inventions, from stone mortars to today’s industries. Flour mixtures are probably one of the most interesting ‘re-discoveries’ of this last decade, using whole grains, including multiple cereals, or even legumes. Dough processing is incredibly diverse. Promoting this diversity is a great way to ensure the recognition of the value of these crops that define us as humanity.

Wheat is most definitely our greatest grain. Roughly 220 million hectares of wheat are grown globally for consumption, adding up to a staggering 23 percent of the calories we live on. It is the staple food for a third of the world’s population, and makes up more calories and proteins in the global diet than any other crop. The Crop Trust has projected a 60 percent increase in demand for wheat by 2050.

Given that most current wheat production has plateaued in yield, protecting the diversity of this essential crop, particularly its most resistant, nutritious and least resource-intensive varieties, is now more urgent than ever before.

‘The wheat collection of ICARDA spans over 55’000 unique accessions. These are mostly what we call ‘landraces’ and ‘wild relatives’. Durum wheat originated in the Fertile Crescent some 12’000 years ago, and bread wheat – or common wheat – originated from durum wheat approximately 8’000 years ago somewhere between Turkey and Iran. However, it also spread more recently, mostly through European colonisation and then far and wide in the late 1960s through the Green Revolution. Any wheat variety that predates the 1920s is considered a ‘landrace’. These are heirloom varieties, passed within farming families for centuries, and naturally selected by humans to fit their cultivation system. As such, landraces hold lots of genetic diversity and unique characteristics. Even more diverse and unique are the wild progenitors of crops. These are basically weeds that were never selected for domestication, but that have evolutionary relationships with the crop species that we cultivate today.’

- Dr. Fillipo Bassi, ICARDA
EDUARDO GARCIA
Region
Mexico City, Mexico
Favourite way to use wheat diversity
When I was a child, my grandmother used to make bread from the wheat we grew and flour we milled. It was a very simple bread, all we added was flour and water. The bread was cooked in our traditional oven in the ground, whereby the coal added dimensions of flavour. However, it was the flavours of the wheat flour that have stayed with me. It was full-bodied, nutty and alive, completely different to what we get today. In my idea of an utopia, I will be able to source enough of that quality flour to make our breads at the restaurant.

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My story with wheat diversity
I first arrived in Mexico City in 2007, and – having heard many stories about it – was wary of what to expect. In the end, it took me all of about a day to fall in love with this city and I have never looked back! It is a magical place for people and for our food culture to thrive. We are not that far away from some of our farmers, and so can stay closely connected to our products. This country has an amazing climate to grow food in, and an incredible history of food culture to promote. Yet we probably only grow about one percent of what we used to grow – and of what we could grow! The 1994 trade agreement with the United States and Canada (NAFTA) led to a lot of food grown in Mexico being exported and to Mexico importing food from the United States and Canada, at a much cheaper price. Local farmers also moved to the United States, taking their skills and experience with them. This results in less local food production, and imported non-traditional cheap food finding its way onto our shelves. Both a sad and important story to look at.

In the village where I grew up, everything we ate we grew ourselves, and we grew it from seed – seeds that had been saved or traded with neighbours, or bred over years from the strongest plants. These seeds gave us our daily bread. The farmers in our village would work with the sun, moon and stars. In today's world, they would be challenged by climate change and they would struggle to work this way. Seasons are not what they used to be, weather patterns are changing and smallholder farmers are left at risk. Because of this, I really believe that we need to push education, especially in areas where people have little access to schools, and where most of our food is grown. We might sit in the cities and discuss soil health and regeneration over a latte, but this won’t benefit the people who are actually growing food and do not necessarily have education at hand.

While the main crop used in Mexico has traditionally been maize, we today import a lot of wheat from the United States and Canada. Although it has been a challenge to source local wheat, we have found amazing producers close by. They produce small amounts, but we take whatever we can get. The demand for this type of local produce is just not there yet, but we as chefs can help create the demand by sourcing what we can from such growers. On a positive note, there is definitely a resurgence in the old, natural ways of farming from those who are educated and able to pursue it. As chefs, we can create a demand that is stable for these farmers so they can expand and encourage more to do the same.

CALL FOR ACTION!
The restaurant industry is a beautiful business, full of opportunities for chefs to meet people, to go places, to listen to new ideas – and most importantly to learn! Consider carefully where all your ingredients come from, be aware of food systems’ harmful effects on the planet, and aim to make positive choices. As a restaurant owner, you are part of a system that has the potential to destroy or to nurture. I want to teach the younger generation of chefs that it is not all about awards, stars and the limelight, but about responsibility and the ability to create change and nurture our earth.

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My story with wheat diversity

I am a pastry chef from the UAE. As an Emirati, I am incredibly proud of our food culture and would like to share as much of it as possible with the world through my baking. I love to share local ingredients – sourced from local growers – and ideas that people have not yet tried. When I started my journey in the kitchen many years ago, I was struck by the importance of ingredients and how much chefs relied on these to create their magic. It soon became clear to me that the flavour and quality of ingredients are all based on the growing and sourcing. If your fresh food is travelling thousands of miles, chances are many subtle flavours and nuances will get lost. Add this to the carbon footprint factor and it is clear that local and seasonal is the best food to work with.

I discovered that although I was cooking in the UAE, it was rare to find people who knew about our local dishes and ingredients. That seemed strange to me, living and working in a country but not utilising a local food culture to inspire and create in our kitchens and to share with the world. It became clear that my passion lay in working with sustainable produce, creating dishes inspired by Emirati culture and heritage that people from all over the world could relate to. Today, I bring these dishes out of the home kitchens, using delicious local produce and allowing them to shine.

Like in many cultures, bread is a huge part of the Emirati food heritage. Flour, salt and water. These three simple ingredients carry so much insight into food cultures! Bread has a uniting factor too – it is for everybody. We all have our own bread culture, even if we do not grow wheat in our respective countries. Wheat is not grown in abundance here in the UAE, however we have many projects on the ground working with farmers and introducing crops and varieties of crops that work well in desert environments. It is promising, and as a chef I look forward to supporting these projects.

In the meantime we source our flours from our closest neighbours where possible. The quality of the flour is immeasurably important as a pastry chef. I keep the communication lines open with the farmers as the character of our wheat flours change every year, and it is good to know what you are dealing with. If there were heavy rains, it is possible that the grain will be more hydrated and so you need to adapt and tweak accordingly. This is where talking to the people who grow our food is so important and underpins what we produce as chefs.

CALL FOR ACTION!

In terms of sourcing, always start local where you can, then move further afield. Check neighbouring countries and go a step out at a time. Start small and expand. Chances are that the less time it takes for your wheat and ingredients to travel to you, the better the quality of your product will be.
Originally from Modena, the home of the great Chef Massimo Bottura, I am aware of the importance of a rich food culture, as well as a strong agriculture linkage to stimulate good food production. We know well that we cultivate what we eat. If we only eat three food types, then we only cultivate three crops. If we want biodiversity in the field, we need diversity on the table. Here, chefs have a quintessential role to play, using different crops or livestock to develop or re-discover tasty and nutritious recipes. The more consumers are attracted to new (or old) food, the more farmers will be pushed to cultivate them.

We have to be careful when talking about biodiversity. There is a reason why some crops have become more widely spread than others. While it is true that we need to promote more farm diversity, this cannot only be achieved using ‘abandoned’ crops, but also with different varieties of our more traditional staple crops. For instance, an heirloom tomato is still a tomato, but there are hundreds of variants, each with its own characteristics. The same goes for cereals. Pasta, for instance, has become a major consumed food, and couscous is gaining new appreciators, but these are just two types of durum wheat foods, and each requires different varieties to be produced. The good varieties for couscous are not the same ones as for pasta, and even different types of pasta can be obtained with different varieties of wheat.

The genebanks have conducted collecting missions around the world to discover, document, collect and maintain these unique plants. As such, the genebanks are true reservoirs of diversity and hold human agriculture history in trust. However, farmers have replaced their landraces with modern varieties because of their higher yields, better cultivation, and several other characteristics. While this has been a strategic step to substantially eradicate hunger from large parts of the world, it has also resulted in a severe reduction of the genetic diversity available to breeders for delivering next varieties. Imagine for instance making a new car using only the pieces of an old one. Despite new and better ways of combining the pieces, sooner or later the progress would stop. This is the same for plants.

As breeders, we are trying to develop new varieties which will not only ensure higher production to feed the rising global population, but also allow us to produce in a more sustainable way, deliver more nutritious food, and withstand climate change.

When thinking of genebank diversity, the sky’s the limit. Science and cooking have not always seen eye to eye. If anything, the recent trends seem to push chefs away from anything that is science-based or technology-driven, and instead towards a more ‘natural’ approach. I think this stems from a terrible misconception that must be corrected. I believe scientists and chefs have basically the same goals: we need to produce better food, more sustainably, with a more equitable distribution of income to rural communities. We are facing a very real fight against climate change; farmers are struggling. And now with Covid-19, we are also struggling to keep restaurants open. I believe chefs are outstanding at telling a story with each dish and I think many of the scientific stories are as captivating as stories from the farms. As scientists, we need to become better at telling stories, and chefs can then be empowered to pass along these stories in their cooking.
Although over 100 varieties of wheat are currently being cultivated, global production is almost entirely based on two varieties, *Triticum aestivum* and *Triticum durum*, the former accounting for about 95 percent of world production. 

Source: Crop Trust

Historically one of the Mediterranean’s most significant crops, durum wheat is a hard, nutritious wheat that produces a coarse flour known as semolina. It is a significant source of various B vitamins, iron, protein, and fiber. Durum wheat is one of the two main species that global wheat production relies on, though it accounts for only 5 percent of the world’s wheat production, with the other 95 percent made up of common wheat.

Source: Crop Trust & Food Forever

Wheat accessions in Svalbard: 100’101
Global accessions: 464’352
Source: Crop Trust

Over 600 million tons of wheat are produced each year from about 210 million hectares, making it the world’s most widely grown crop.

Source: Crop Trust

Tools to find out more
Chefs’ Manifesto Instagram: @chefsmanifesto
Chefs’ Manifesto Website: www.chefsmanifesto.com
SDG2 Advocacy Hub Website: www.sdg2advocacyhub.org
Food Forever Website: www.food4ever.org
For sources and more data, visit: www.chefsmanifesto.com/casestudies
Produced in collaboration with the Crop Trust and Food Forever