Taxonomy

Roadmaps to the origins of the potato



David Spooner *is a taxonomist at the United States Department of Agriculture (USDA) who collects wild and cultivated potatoes and studies their species boundaries and relationships. His recent discoveries have helped re-write much of what we thought we knew about the origin and evolution of the cultivated potato.*

In 2005, you co-authored a paper that overturned previous ideas about the evolutionary history of the potato. What were your findings?

"What we demonstrated was that the cultivated potato has a single place of origin, in Peru. Up until then, all publications had hypothesized that the early Andean and Chilean cultivated forms of potato had evolved from different progenitors. For the potato, the domestication hypotheses had suggested complex hybrid or multiple independent origins from what is known as the *Solanum brevicaule* complex, a group of 20 morphologically very similar, tuber-bearing wild taxa, broadly distributed from central Peru to northern Argentina. Now, as part of a study of the taxonomy of that complex, I and a group of scientists from the Scottish Crop Research Institute were analysing accessions of potato landraces when we made a surprising discovery. At the molecular level, the accessions all group together, not in separate places on a 'phylogenetic tree' with different wild species, as would be expected with many separate origins. Based on our initial results with these cultivated species, we broadened the study to analyse DNA markers in 261 wild and 98 cultivated potato varieties, and our data indicated that those early cultivars originated from a single ancestral line in the 'northern' component of the *S. brevicaule* complex in central or southern Peru."

And how important is that finding?

"For Peru, of course, it was great news, and a source of national pride. But that aside, the purpose of taxonomy is to help determine what is a species and to classify species into related groups, providing other scientists with a roadmap to guide them down proper research paths. If the taxonomy is bad, research goes awry. In fact, another of our

findings was that what were considered member 'species' of the *S. brevicaule* northern group were poorly defined, and that further studies might reduce them to a single species."

Another of your recent papers has broken new ground by reclassifying the cultivated potato into four species.

"That was from a study done with the International Potato Center [CIP] in Peru. We carried out one of the largest molecular marker studies ever done on crop landraces, covering 742 landraces of all cultivated potato species and eight closely related wild species progenitors. Until that paper, there were many different ideas about the number of cultivated potato species – the widely used classification of [British plant geneticist] J.G Hawkes identified seven species and seven subspecies, while Russian taxonomists recognized as many as 21 species. But, in combination with the findings of earlier morphological analyses done with CIP, our analysis found just four: *Solanum tuberosum*, divided into Andean and Chilean cultivar groups, and three hybrid cultivated species of 'bitter potato'. We also found that consistent and stable identification of the other purported 'species' was impossible, and only created confusion."

Now, to your third recent discovery, published in 2008, about the introduction of Chilean germplasm in the modern potato. What was at issue there?

"All modern potato cultivars have predominantly Chilean germplasm. To explain that, Russian investigators proposed that the potatoes introduced into Europe were Chilean landraces, while British investigators thought they came from the Andes but were killed off in the late blight epidemics of the 1840s, and replaced by introductions from Chile. My student Mercedes Ames and I addressed this question by examining 49 European herbarium specimens collected between 1700 and 1910, for a DNA marker that distinguishes Andean from Chilean landraces. The results showed that, yes, the Andean potato predominated in Europe in the 1700s and persisted until 1892 – long after the late blight epidemics – while the Chilean potato first appeared in Europe in 1811 and became predominant long before the late blight epidemics."

This may be an unusual question. Having collected potato throughout the Americas every year since 1989, have you formed a "spiritual connection" with the plant?

"I'm not driven primarily by potatoes. I am directed by USDA to work on the potato, but my real motivation is the intellectual exercise of finding answers to the complex taxonomic and biological questions posed by the potato. What makes this job so fascinating for me is the great infrastructure that is available for potato research and which makes those answers possible."

History

How the potato changed the world



In a long career, **John Reader** *has photographed Rolling Stones' recording sessions in London and australopithecine footprints in Tanzania, and written acclaimed works such as* Man on earth *and* Africa – biography of the continent. *His new book is* Propitious esculent: the potato in world history.

How did people react when they heard your next book was about potato?

"The potato is the best bundle of nutrition known, but it's not easy to persuade people to take it seriously. As a topic of conversation, it inevitably evokes some degree of mirth – or a condescending smirk from those who consider the topic not just amusing, but foolish too. People simply do not believe such a commonplace commodity deserves serious attention."

When did you first take an interest in *Solanum tuberosum*?

"To be fair, I didn't take the potato seriously either until I lived in the far west of Ireland for 18 months in the 1960s. There, the potato was ubiquitous – in books I read (especially Cecil Woodham-Smith's *The great hunger*), in gardens and heaped on the plates at meal times. But even then I looked upon it mostly as an item that soaked up the gravy and filled the bellies of people who couldn't always afford anything better. It was only 20 years later that I began to appreciate the potato's true worth. Awareness of environmental issues was widespread by then. Science had long since demonstrated that people, society and culture are integral elements of the planet's ecological webs, and now some fascinating examples of human ecology were trickling through to a lay audience. I, for one, was impressed by the ecological explanations of Marvin Harris [in *Cows, pigs, wars and witches*, 1974] for such – apparently – irrational cultural practices as India's sacred cow and the Jews' avoidance of pork. My interest developed into a book [*Man on earth*, 1988], for which the academic literature provided many examples from around the world of how an environment and the staple foods it provides can influence human affairs."

In *Man on earth* you devoted a chapter to "the potato growers"...

"In particular, the work of Stephen Brush [Professor, Faculty of Agricultural and Environmental Science, University of California, Davis] on the economy and human ecology of an Andean valley introduced me to a fuller appreciation of the potato's merits. He and other scientists showed how astutely Andean farmers had adapted the inherent variability of the potato to their own ends, developing patterns of land-use and cultivation that not only created a sustainable way of life for themselves but also ensured the continued survival of the potato's extensive gene pool. Popular interest in the preservation of genetic diversity was growing at the time, so the potato fitted well into the theme of *Man on earth*. But I was struck too by the economic role the potato has played as people have moved from closed self-sustaining farming communities to societies for whom trade and economic activity have been the principal means of sustenance. That was worth a book in itself."

So, briefly, what has been the impact of the potato on world history?

"The potato played a crucial role in the development of a succession of imperial states in its cradle land – the Andes – but its influence has been most dramatically illustrated in Europe, following its introduction by the Spanish in the late 16th century. Nothing like this had happened before – anywhere. After depending upon grain for thousands of years, Europe now had a supplementary crop that not only flourished in a wider range of soil and climatic conditions but also produced four times more carbohydrate per unit of land and labour. Wherever the potato was adopted, populations grew rapidly, which in turn supplied a large and cheaply nourished labour force just at the time when trade and industry were replacing agriculture as the dominant feature of European economies. Thus the potato fuelled the Industrial Revolution, and from Europe has spread around the world – staving off hunger, improving nutrition and fuelling the development of economies."

And how do you see the role of the potato in the world today?

"Today, the potato is grown in more countries than any crop except maize, and is increasingly consumed in a processed form as more and more people take to living in cities. Already, more than half the global population are city-dwellers – their higher incomes and improved standards of living have generated a taste for something more than the simple boiled potato. Of course, industrial processing favours large-scale production, but that in no way detracts from the advantages the potato offers small farmers in the developing world. They will always take the potato seriously."

Biodiversity

A view from the Andes



Lino Mamani *is a* papa arariwa *("potato guardian", in Quechua) in the Sacaca farming community near Pisac, in the Peruvian Andes. The community where Mamani lives, together with five neighbouring communities, have established a 12 000 ha "potato park" where they cultivate and conserve Andean potato varieties.*

How did the potato park come into existence?

"Our communities signed an agreement in December 2004 with the International Potato Center [CIP], to establish the park and to work together to preserve our potato biodiversity. This area has about 600 native varieties that we have always grown here. CIP has also repatriated to us hundreds of varieties from its collection, and with the help of our *Pacha Mama* [Mother Earth] we are adapting them to live here."

How many varieties are you now cultivating?

"We have about 1 000 varieties of native potatoes here. We have planted the repatriated varieties in different parts of the mountains, where they are learning how to adapt themselves, how to live in the places where we have put them. We know that some like it a little bit colder and some a little bit warmer. *Pacha Mama* knows how to nurture them. With a larger number of varieties we make *Pacha Mama* happy, so she will allow us to have bigger harvests and provide food for our families."

Do you grow any modern varieties?

"We don't like modern potatoes – we have had bad experiences in the past because they need chemicals and pesticides, which poison the earth, and they don't grow well on our land. Our native varieties live well with their wild relatives, which you will find all around here. They have a good relationship, like a family. But our potatoes don't live well with modern varieties. The potatoes you see here belong to us. They came to us from our ancestors and will go on with our children."

How do the communities work together?

"If we succeed in adapting a variety to our area, we share it with the other communities.

All of the communities in the park work together like one person. But we are concerned about our legal status. We want the national government to recognize the potato park and the work that we do, so that the park will continue to be managed by and for the communities. We have asked the Regional Government of Cusco to create a biodiversity fund that will protect the traditional life of the communities and provide legal status for the potato park."

Have you seen the effects of climate change in this valley?

"In the old days, the rain came at the right time, the land was very fertile, and the sun used to shine in the right amount. Now we see that the sun is hotter, the rains do not come at the right time, we have hailstorms and freezing temperatures, and droughts like we have never seen before. There is also an increase in insect pests and diseases. The potato varieties that our grandfathers grew down by the river are now moving higher up the mountain slopes. In this land, we have our *apu* [sacred mountains] around us, which help our potatoes and the other crops and animals to grow. Once there was snow on those mountains, now they look sad, because the climate is getting warmer and there is no more snow. Other species and animals are suffering – the condor, foxes, deer, ducks and fish that have always lived with us and are very dear to us. We know that *Pacha Mama* is not happy with all these changes and we have to work together to make her happy again."

Climate change

Who gains, who loses



Marco Bindi, *of the Department of Agronomy and Land Management at the University of Florence, Italy, has participated in EU-funded projects on the impact of climate change on natural and agricultural ecosystems, and is a lead author of the Fourth Assessment Report,* Climate Change 2007*, of the Intergovernmental Panel on Climate Change (IPCC).*

How does the build-up of atmospheric greenhouse gases affect potato production?

"In C3 plants, such as potato, an increase in atmospheric concentrations of carbon dioxide leads to a higher rate of photosynthesis. Currently, the level of CO_2 is about 385 parts per million [ppm], and the latest IPCC emission scenarios project levels by the year 2100 ranging from 540 to 970 ppm. Experiments on potatoes have shown that increasing CO_2 concentrations has little effect on the production of biomass above ground, but the below-ground biomass is significantly enhanced through higher numbers of tubers and bigger tuber size. The yield increases by about 10 percent for every extra 100 ppm. As for the effects of increasing levels of ozone, experiments indicate an overall reduction of photosynthetic efficiency and a significant decrease in tuber starch content, but an increase in the ascorbic acid concentration."

What effect will global warming have on the potato?

"This century could see a rise in average global surface temperature of from 1.8° to 4°C. Since potato's tuberization rate declines above a temperature of 17°C, increasing temperatures may lead to reduced yields in potato varieties now cultivated close to the upper climatic limits of the crop that would not be recovered by higher levels of carbon dioxide. On the other hand, a simulation study has shown that in northern European countries, a warmer climate would bring a longer growing season and big increases in yields. Areas that are now too cold for potato – for example, parts of Canada, Siberia and Scandinavia – may become viable, as would highland areas such as the altopiano in Peru and Bolivia. But the global picture is

worrying: worldwide research shows that, without adaptation, higher temperatures reduce yield by 10 to 19 percent in 2010-2039 and 18 to 32 percent in 2040-2069. The most vulnerable area is the tropical belt, where the loss could be more than 50 percent."

Potato is highly sensitive to water stresses. How will climate change affect water availability?

"The change in temperature will be uniform, but not that of rainfall. There will be an increase in rainfall in mid- to high latitudes – areas with no water shortages – and problems instead for the Mediterranean and subtropical zones, where we will see rainfall on fewer days but with greater intensity. A crop growth simulation experiment on an EU scale reported that, under the present climate change scenario, yields under rain-fed conditions were strongly affected by water shortages, with reductions of up to 50 percent. In arid regions, where drought is expected to become more frequent and more intense, there will clearly be a drop in productivity."

Could climate change also lead to an increase in potato pests and diseases?

"Given the thermal limit for late blight – 22°C – increases above that temperature threshold in Europe may prevent infections. At the present northern limit of potato cultivation in the USA, Canada and central Russia, late blight could increase significantly as the temperature increases, but at the same time, warming further north may open up new zones for potato production, with minimal late blight risk. An increase in the quantity and frequency of rainfall would also create conditions more favourable to viral disease vectors. Other researchers have predicted an increase in the Colorado potato beetle's area of diffusion in Europe, as well as in the area infested by potato cyst nematode."

How can potato cultivation adapt to climate change?

"Anticipating the planting date, using different potato varieties and improving soil water supply, especially in dry regions, might be useful. According to one study, those strategies could cut by half the expected decrease in global yields. In southern Europe, earlier planting increases potato yields and reduces water requirements in both present and future climate scenarios. But in practice, adaptation options may be not so simple. The planting season also depends on factors such as the preceding crop, water availability, pests and diseases, and markets. Cultivars better adapted to a changed climate exist, but may not be available to farmers in some regions. Another strategy is shifting potato production towards areas of higher productivity or areas where there is currently no potato production. In some tropical highland regions, cultivation could expand into higher altitudes. At high latitudes, there could be considerable potential for expansion of the potato area."

Genetics

Unravelling the potato genome



Christian Bachem, *of the Department of Plant Sciences, Wageningen UR, the Netherlands, is coordinator of the Potato Genome Sequencing Consortium (PGSC), an international research network that aims at revealing the potato's complete set of DNA by the end of 2010.*

Why is it so important to sequence the potato genome?

"Cultivated potato is what we call a highly heterozygous, self-incompatible outbreeder – in practice this makes it impossible to produce true breeding lines and so genetic improvement is a complex and lengthy process. We estimate that well over 40 000 genes are encoded by the genome. The problem is these genes are not conveniently located in clusters. By unravelling the complete DNA sequence, we aim at localizing and identifying the genes coding for important traits such as disease resistance, but also for nutritional attributes, such as starch quality, protein and vitamin content. Genomic sequencing will deliver molecular markers that breeders can use to increase the efficiency and rapidity of their breeding programmes. In the longer term, the full genome sequence will form the basis for understanding the biological processes underlying complex traits such as yield and quality."

What do we already know about the potato genome?

"The potato has 12 chromosomes, each one about 70 million base pairs long, which makes it about a quarter the size of the human genome. We estimate the size of the complete sequence at 840 Mbp [Mega base-pairs], which means 840 million nucleotides that line up in a particular order to form the potato's chromosomes."

How is the Potato Genome Sequencing Consortium organized?

"The consortium consists of nationally supported scientific research institutes in Argentina, Brazil, China, Chile, India, Ireland, Netherlands, New Zealand, Poland, Peru, Russia, the UK and the United States. Each national partner will sequence at least a third of a chromosome, and each chromosome has been assigned to one or more countries."

What is your approach to sequencing the potato genome?

"Mapping the DNA code of over 800 million base pairs is a huge technical and bio-informatic challenge. At Wageningen's Laboratory of Plant Breeding we are using a novel approach for mapping and aligning a library of large chunks of potato genomic DNA called "bacterial artificial chromosomes", or BACs, which are small, manageable parts of the entire genome, averaging 120 000 nucleotides. The technique involves first creating an ultra-high density genetic map of the potato genome using molecular DNA markers. The DNA markers with a known genetic location can then be used to identify groups of overlapping BACs to form a physical map."

What is the current status of the PGSC project?

"We are currently assembling the Potato BAC library into a physically and genetically anchored map, which will allow the sequencing of relevant chromosome sections by consortium partners. Most of the partners have been able to raise funding for sequencing the chromosomes assigned to them and, in most cases, have established sequencing facilities. One important initiative the PGSC is pursuing is a collaborative training scheme with countries that have identified specific gaps in their know-how. Through this collaboration, junior scientists will visit our facilities for training, for example, in bioinformatics. These arrangements have been made with China and Brazil and discussions are underway with other consortium members."

How much will the entire project cost?

"Sequencing of the human genome was achieved in 2003 at a total cost of about $800 million. Since then, the cost of sequencing has been very much reduced. The total cost of sequencing the potato genome would be, we estimate, around €25 million. An equal amount is probably needed for closing gaps and for the bioinformatics needed for assembly and annotation. A worldwide effort of around €50 million is therefore likely to be needed."

What is the PGSC policy on sharing genome data?

"We have an open information policy. All data is intended to be freely shared between the consortium partners and the scientific community at large. The data of the potato genome sequence is shared within the consortium for six months for quality control, after which it is being released as nucleotide flat files in the public domain."

Private sector

"Knowledge and expertise we can share"



McCain Foods Ltd is the world's largest producer of frozen potato products, mainly French fries destined for restaurants, fast food and retail chains around the globe. **Bertrand Delannoy**, *who joined the company in 1989 as an agronomist, is now Director of Public Affairs and Sustainability for McCain Continental Europe.*

Among private sector companies, McCain has been the strongest donor to the International Year. Why did McCain decide to back IYP?

"McCain has been in the potato business now for more than half a century, starting from a small factory in Florenceville, New Brunswick, and expanding since then, first to North America, Europe, and Australasia, and since the mid-1990s to Latin America, South Africa and Asia. Today we operate in 130 countries and have 57 production sites on five continents. But for us the potato is more than simply business. We share the UN Millennium Development Goals, and we saw IYP as an opportunity to help educate the world about the nutritional value of potatoes and about key issues in fighting hunger and poverty – sustainability, delivering nutritious and affordable food, strengthening farming capabilities in developing countries, and collaboration in development of new varieties. McCain has a global presence that can reach the world's hungry, with knowledge and expertise we can share."

McCain provided funding for the activities of IYP national committees in 14 developing countries. What do you hope your support will achieve?

"The committees aim at bringing together the entire community of stakeholders – farmers, public and private sectors, NGOs, civil society and scientific institutions – in promoting the potato, increasing potato production and adding value. They are catalysts for national potato development programmes in the future. We are proud that the support McCain provided has gone into IYP information campaigns in Turkey, South Africa and Rwanda, the preparation of a potato development strategy in Côte d'Ivoire and a study of potato trends in China, and

Peru's first national potato congress. In the Democratic Republic of Congo, the national committee is now working with an ongoing partnership McCain has built up with local institutions in Kinshasa to promote good practices in peri-urban potato farming. We hope to see the benefits of that collaboration in the years ahead."

Potato production and consumption is expanding strongly in the developing world. What is McCain's strategy for entering those emerging markets?

"McCain is expanding its business in the developing world. Our strategy is, first, to assess the local potato platform – factors such as farming practices and upstream logistics, including storage. It is also important to us to create a direct, long-term 'win-win' relationship with our growers. Sometimes we acquire existing processing plants, such as in South Africa, or we develop 'green sites', from scratch, as we did in Argentina. When we started in Argentina, farmers were still harvesting by hand. We introduced modern production techniques and since then we have seen double-digit growth, thanks largely to exports to the big Brazilian market. In India, we recently opened a new processing plant in Gujarat State that draws on a network of contract farmers whom we train in improved practices, such as drip irrigation, which cuts growing costs, and high temperature potato storage, which means big savings in power. In China, we are in a learning process, with the huge opportunity of growing, processing and distributing our products in what promises to be the world's biggest market."

Your core business is potatoes. How do you respond to criticism that potatoes, particularly as French fries, are responsible for overweight and poor nutrition?

"Potatoes are among the most efficient sources of energy and nutrients, with a higher content of Vitamins A and C and other micronutrients when compared to rice or maize tortillas. It also has some of the highest levels of potassium, which has very positive benefits for heart health. So it is an essential part of a healthy diet. But at McCain we are committed to continually improving the nutritional profile of our products to meet consumer needs and concerns. For example, we changed all of our cooking oils worldwide to virtually eliminate trans fat and reduced our overall saturated fats to levels well below WHO guidelines. In mature markets, such as Europe, we are developing non-fried solutions, with significant diversification toward oven and pan products. In South Africa, where logistics can be a problem, we also aim at producing and distributing dried potato product solutions, enriched with macro- and micronutrients, which are cheaper to distribute and also contribute to an affordable and nutritious meal for low-income consumers."

The International Year

New light on a hidden treasure



As the roots-and-tubers specialist at the Food and Agriculture Organization of the United Nations in Rome, **NeBambi Lutaladio** *found himself with an additional task in 2008: that of coordinating the implementation of the International Year of the Potato.*

The announcement of the International Year was met with scepticism. Do you think people are starting to see the point now?

"Some people were surprised to see the UN dedicating a whole year to something as common as potatoes. But we saw it as a great opportunity to raise global awareness of the potato's true value for rural people, for the economy and for world food security, and also to focus attention on FAO's overall mandate, which is agricultural development. The momentum is really building now. That is partly thanks to our information campaign and to the positive response of governments and the private potato sector. Also, with world food prices rising, the potato is attracting a lot of attention as an alternative food crop."

The slogan of IYP is "hidden treasure". In what way has it been "hidden"?

"Many people were simply unaware that the potato feeds the world – it is our most important non-cereal food, and its production has been increasing in developing countries faster than that of any other major crop. Its role in nutrition is also often under-valued, and in developed countries the potato is often associated with weight problems. So, one of the objectives of IYP is to teach people that potatoes have positive nutritional benefits, that they are rich in fibre, vitamin C and potassium, and have good quality protein. Finally, the potato also has great 'hidden potential' for productivity increases – some potato scientists say a 30 percent increase in yields is now within reach."

IYP maintains that potato production can help achieve UN Millennium Development Goal No. 1, to reduce poverty and hunger. How?

"The potato is very well suited to places where land is limited and labour abundant. They grow fast, they are adaptable, high yielding and responsive to low inputs. Farmers in highland areas of Africa can

harvest 25 tonnes of tubers from one hectare in just 90 days, which is why potato production is booming in countries like Uganda. When you add value to production like that, through better storage and processing, you not only meet food needs, but have a highly profitable cash crop that can drive economic development and sustain livelihoods."

Potato yields in the developing world are a third of those achieved in some developed countries. What needs to be done?

"To increase productivity, IYP is promoting a shift in developing countries to potato-based farming systems that use quality and reliable seed potato, varieties that are virus-free and drought resistant, improved plant nutrition and integrated pest management. But technology improvements need to be accompanied by other, more general measures for agricultural development, such as improved farmer access to extension, credit and production inputs, better post-harvest management and links to agro-processing and markets."

How are countries around the world celebrating IYP?

"Naturally, we've seen a lot of enthusiasm in the Andean countries of South America, with national potato days, potato growers' congresses, festivals of biodiversity, cooking contests. Elsewhere, we have a nation-wide campaign to promote potato consumption in Bangladesh, scientific conferences on potato production, poverty alleviation and late blight, and potato harvest festivals in rural areas and towns across North America and Europe. Ordinary people are organizing art exhibitions, block parties, and school events. We have limited funds to support these events, but we are providing seed funding for national IYP committees in 20 countries of Africa, Asia and Latin America to support awareness campaigns."

You mentioned food price inflation. Can potato really help lower food prices?

"That is something FAO is studying very closely now. International prices of most agricultural commodities – not just for cereals, but for vegetable oils, soybean and dairy products – are at very high or even record levels. One of the longer term strategies that can help ease the strain of food price inflation is to diversify the crop base to nutritious and versatile staples such as the potato. Unlike major cereals, the potato is not a globally traded commodity – its prices are determined usually by local supply and demand, so it escapes the kind of speculation we are seeing with cereals."

Culture

"In front of a potato, we are all equal"



Stanislav Menard *is a businessman whose paper factory in Slovenia churns out 3.5 billion envelopes a year. But away from his high-speed machinery, he has a special interest: he's president of the Slovenian Society for Sautéed Potato and Onions...*

When we first heard about your association, we thought it was a joke...

"Yes, it did start as a joke. Our society was founded in 2000 by five professional people in [Slovenia's capital] Ljubljana, who all enjoy eating our national dish, *pražen krompir*, which means sautéed potato. But over the years it has grown into an association of more than 2 000 people in more than 20 countries, and in September we expect 15 000 people to come to our 8th World Festival of Sautéed Potatoes."

What's so special about sautéed potatoes, Slovenian style?

"They are delicious. First you cook the potatoes in simmering water, very slowly, for up to 40 minutes. After they're cooked, you wash them in cold water for a minute and peel them. Then you pan fry the onions in a little pork fat or olive oil, also very slowly, for about 15 minutes at low temperature, until they practically disappear. Then you add the potatoes cut into thin slices and stir for another 20 minutes. That's the basic recipe. You can add mushrooms, vegetables or *prosciutto*. It's a full meal – in fact, our society's full name is 'Slovenian Society for the Recognition of *Pražen Krompir* as an Independent Dish'."

But that's nearly 90 minutes of preparation time...

"And that's the beauty of *pražen krompir*! One of the basic rules of our association is that members should get together to prepare a meal of sautéed potato and onions at least once a month. In 90 minutes, over a frypan, you rediscover the importance of sharing time with your friends and enjoying a meal together, two things that are being lost in our fast food culture. The other rule is that no one should talk politics – in front of a potato, we are all equal."

Is any particular variety best for *pražen krompir*?

"Each year we plant 20 to 25 different varieties of potato in our field in Ljubljana and in September we harvest them for testing. It's a big event, with 20 members serving as judges. Each variety is prepared in exactly the same way and we have strict judging criteria. What we are looking for is a potato with a creamy, buttery taste, one that melts in your mouth. Each year a different variety wins, but some members are particularly fond of our Slovenian traditional variety, the Igor, while others prefer the Royal Jersey. As an association we organize trips to potato growing areas of other countries to sample their potatoes as well. Our members have been to Jersey, the Czech Republic, Ukraine, Poland and even to Peru in 2006."

So Slovenia has had a long love affair with the potato?

"Actually, we were one of the last countries in Europe to adopt it, and then only by force. Agriculturally, Slovenia in the 18th century was a poor country, and famines were frequent. After a series of famines in the mid-1700s, Maria Theresa, the archduchess of Austria, decreed that our farmers should start growing potatoes. It was the beginning of a new era. Slovenia is a mountainous country and ideal for potato. Suddenly farmers had a reliable food supply, and feed for farm animals. There is one town, Šencur, that became such an important exporter of potatoes to Austria and Germany that it was called Kartoffeldorf [literally, "potato town" in German]. So what the International Year of the Potato is preaching is absolutely true – the potato *did* save Slovenia from hunger."

And it's in Šencur that you unveil a monument to the potato on 25 May...

"Yes, it's a bronze, life-size statue of Maria Theresa in peasant's clothing, seated and offering a potato in her outstretched hand. It's a mark of gratitude to her and to the potato. We are expecting a big crowd, including the European Ministers of Agriculture who will be meeting in Slovenia on the same weekend – but they will have to queue up for the potatoes like everybody else."