

Ngā Riwai Māori — Māori Potatoes

Graham Harris, Poai Pakeha Niha



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Abstract

It is generally accepted by scholars that potatoes were first introduced to New Zealand in the late eighteenth century by Captain James Cook and the French explorer, Marion du Fresne. Further introductions from a variety of sources, including possible direct introductions from South America, followed into the nineteenth century. Māori were quick to recognise the advantages these new introductions had over the kūmara (*Ipomoea batatas*) and other traditional food sources. Potatoes soon became both a staple item in the Māori diet and a trade commodity. The various cultivars (cultivated varieties) were given Māori names and many of these early introductions are still grown by Māori today. These 'Māori potatoes' with their deep-set eyes, often knobbly irregular shape and colourful tubers, are quite distinct in appearance from modern potatoes and are known by Māori as *riivai*, *taewa*, *parareka* and *māhētau*.

Keywords

Māori potato; riwai, taewa; mähētau; parareka; early history of potatoes in New Zealand; *Solanum tuberosum* subsp. *andigena*.

Ethical statement

In conducting this research project the author has followed the principles of ethical conduct as stated by Ngahuia Te Awekotuku in '*He Tikanga Whakaaro — Research Ethics in the Māori Community*' and in the '*Mataatua Declaration on Cultural Property and Intellectual Property Rights of Indigenous Peoples 1993*'. It is recognised that some of the information in this paper is *Mātauranga Māori*, and hence the aims of the study and the intention to publish the information were conveyed to informants at the time the information was collected. Some of the plant material was given to the author on the understanding that it was not to be commercially exploited and was solely for the purposes of academic research. The author has applied this principle to all plant material and to all information gathered in the course of this study.

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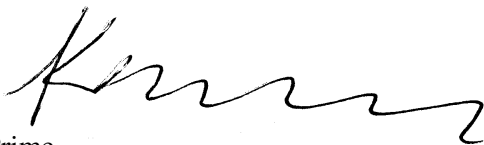
I was somewhat intrigued when thumbing through Graham Harris's paper on riwai Maori to see words that I had not seen for several years. As the only person in our district with a large tractor and heavy duty rotary hoe in the 1960s, 70s and 80s, I was often called upon by the elderly to hoe up their land for gardens in early spring.

The competitiveness of supermarkets in recent years has resulted in the provision of vegetables to Maori far more economically than was previously possible. But eliminating the need to cultivate, plant, weed, harvest and store garden produce has resulted in the loss of another chapter of our Maori language. Words like 'peruperu' and 'kanohi parera' brought back memories of other Maori words that are not heard any more in daily conversation because we no longer practice the culture of mahinga kai. These are examples that come to mind:

paahika	the act of clearing away weeds, prior to cultivation
koomiri	the act of sorting out or selecting suitable seeds or seedlings for planting
matahina	a seed potato with long shoots that was discarded
kaakati	small bundles (for example, of kumara plants)
ahuahu	the raised mounds of soil on which pumpkins or melons were planted
ahuahua	the raised mounds of soil on which pumpkins or melons were planted
kawaka	the furrow between rows of planting
karawhaea	scarifiers
kaapahu	the main 'breakout' tine of a plough
huahake	taking or digging up root crops

I would like to encourage Graham Harris to continue to preserve remnants of our cultural heritage, which modern technology is causing us to abandon.

Kia ora



Kevin Prime

Ngā Riwai Māori — Māori Potatoes

Introduction

At a conference in Whangarei in April 1996 I met Poai Pakeha (Sonny) Niha. His whānau, who are Ngāti Hine, had been growing Māori potatoes in Tai Tokerau for many years. Sonny sent me a selection of cultivars that his family were growing and my interest in these fascinating vegetables was kindled.

In April 1997 Sonny Niha and I travelled around Northland and talked with Māori people who were growing these potatoes. We listened to their stories and collected more varieties. Many of the older people we visited preferred to speak in Māori and Sonny provided the translation. I continued to collect information about Māori potatoes and added to the cultivar collection which I maintained by growing an annual crop in the Wairarapa.

General interest articles (see appendices) on Māori potatoes were published in the *New Zealand Gardener*, *The Garden* (the journal of the Royal Horticultural Society) and *Te Karaka* — the Ngāi Tahu magazine. The response to these articles from Māori and Pākehā in New Zealand, and also from overseas, indicated that there was wide general interest in the subject. Some of the people responding to the articles sent in potato tubers to add to the collection or for identification. An article, published in July 1998 in the *Dominion*, and illustrated with photos of 16 of the cultivars in the collection, prompted a large number of responses, and even a year later there are enquiries relating to that article.

Graham Harris

Research objectives

The research objectives of this study were to

1. review the origins and early history of the development of the potato
2. review historical and ethnological literature relating to the introduction of potatoes to New Zealand and their impact on Māori society
3. investigate anecdotal evidence that Māori introduced potatoes to New Zealand prior to European arrival
4. investigate the possibility that Māori developed potato cultivars from European introductions
5. collect and record information about the cultivars and compare their characteristics with those of modern potatoes
6. investigate the extent to which Māori potatoes are grown today
7. research the generic and varietal names that Māori gave to potatoes.

Origin of the potato

Salaman (1987) and Hawkes (1990) have written extensively on the origins of the potato. They agree that the potato originated in the Andes of South America, from Peru and Colombia. Hawkes (1990:11) noted that at the time of the Spanish conquests of the Americas (in the sixteenth century), the potato was widely distributed throughout the Andes from Colombia to Peru. Salaman (1987:159) wrote that in South America, the original home of the potato, a great variety of potatoes are cultivated today (see Fig. 1). He noted that there were almost as many varieties in cultivation at the time of the Spanish conquest, which is not surprising considering that there is evidence that the potato was being cultivated 2,000 years ago in Peru (Wilson 1995:11).

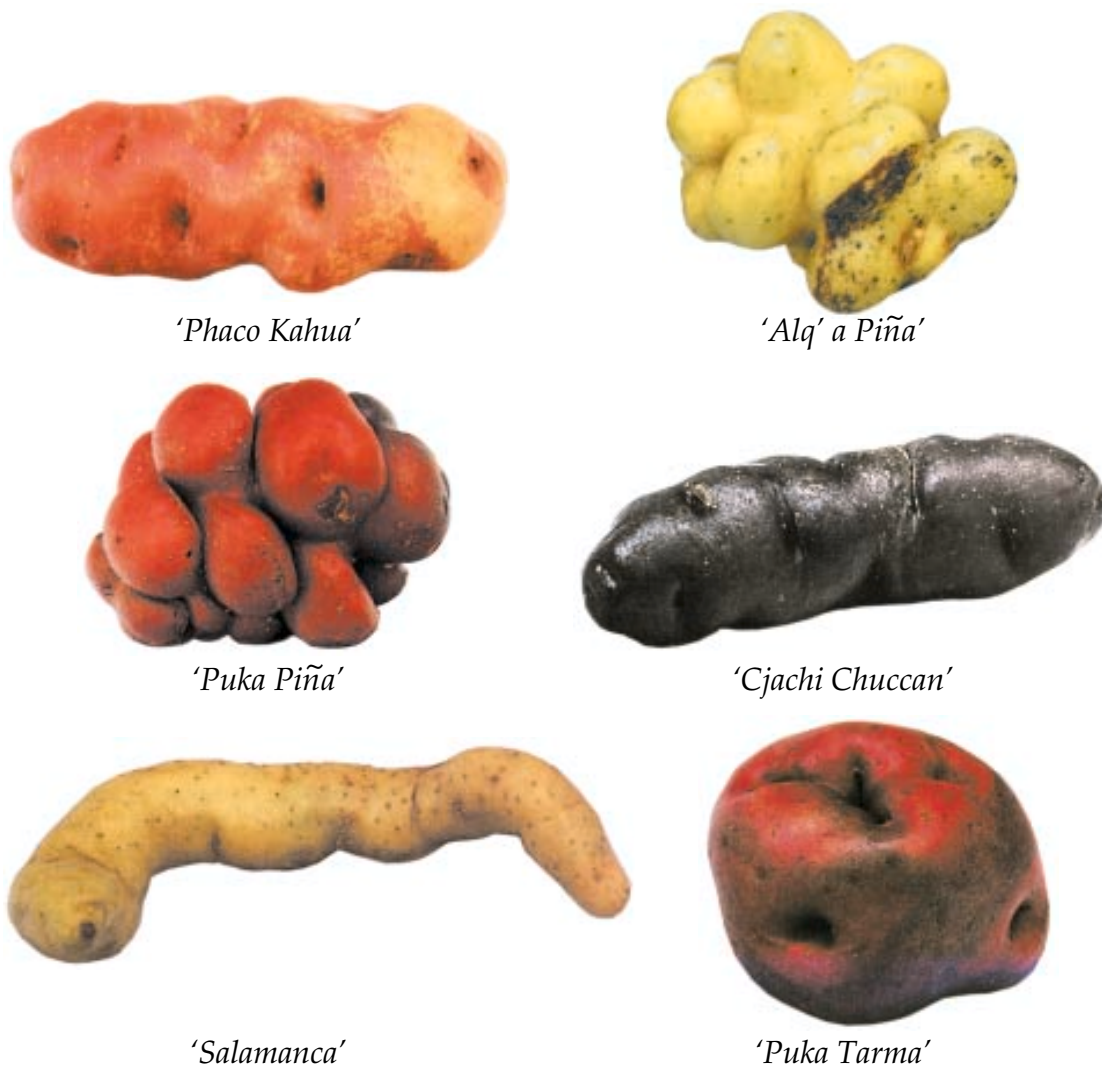


Fig. 1 Papas nativas (*native Andean potato cvs*) labelled with their Quecha Indian names.

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While the natural home of the potato is in the region of the tropics (Salaman 1987:68), Wilson (1995:11) pointed out that tropical heat and high humidity are unfavourable to the potato plant. Indigenous potatoes are grown in the Andes at very high altitudes (c.2,800–4,500m) where temperatures and humidity are much lower than at sea level (Hawkes 1990:11).

Hawkes contended there is little doubt that the first potatoes introduced to Europe were *Solanum tuberosum* subsp. *andigena* from the Andes, and that they were very probably from Colombia. Salaman (1985:160) noted that the original potatoes which reached Europe were themselves varietal hybrids or compound species, while Mackay (1997:564) stated that the potatoes which reached Europe were the culmination of thousands of years of evolution in South America. He recorded 'It is now believed that the first introductions [to Europe] were of a species (still cultivated in the Andes) known as *Solanum tuberosum* subsp. *andigena*.'

History of the potato in Europe and the United Kingdom

Introduction of the potato to Europe and the United Kingdom

Of the introduction of potatoes to Europe, Hawkes (1990:30) noted:

It is a generally accepted fact that the potato arrived in Europe some time towards the end of the sixteenth century. Nevertheless, the exact time of its introduction and the details of its arrival remain obscure and will probably never be fully elucidated.

He went on to state that the available evidence suggests that there were two early introductions of the potato into Europe. The first was into Spain about 1570; the second into England between 1588 and 1593, with a strong suggestion that the actual year might have been 1590. Wilson (1995:11) noted:

the arrival of the potato in Britain remains shrouded in mystery with legends involving Raleigh and Drake however most authorities agree that the date of introduction was likely to have been in the 1590s.

Phillips and Rix (1993:136) noted that there is a suggestion that the English potatoes were probably a separate introduction from those which reached Spain.

Early development of the potato in Europe and the United Kingdom

Because the *Solanum tuberosum* subsp. *andigena* potato that was introduced to Europe and the United Kingdom, was of tropical origin, it was adapted to the short day conditions that are normal near the equator. The reaction of these plants to growing in the long summer days of northern Europe and the United Kingdom was to set tubers very late in the season, as the days shorten in late autumn (Mackay 1997:563). Other characteristic features were very small tubers which developed at the end of long stolons, numerous inflorescences and occasional shoots growing up above ground from the stolons (Hawkes 1990:39). All these characteristics which distinguish early introductions from the potato of today were described by Salaman (1987:67) as 'the reactions of a short-day plant doing its best to survive in a long-day environment.' He also noted 'a constant feature of these early potatoes was the irregular knobbly appearance of the tubers and the great depth of their eyes'.

The potato was not readily accepted as a food source in Europe and the United Kingdom. Rhoades (1982:687) wrote: 'When introduced to Europe, the potato was cursed as an evil food. The Scots refused to eat it as it wasn't mentioned in

the bible.' Wilson (1995:12) noted: 'For several years the only potatoes growing in Britain were in the gardens of botanists interested in the plants, rather than the small knobbly tubers.' It was recognised that the leaves of the potato were poisonous, and that the tubers became green and bitter when exposed to light. Wilson (1995:13) noted that these features caused much consternation and that 'much illness and sickness was attributed to the potato.'

Phillips and Rix (ibid) noted that the European potatoes were selected and bred from those forms that happened to arrive in Europe at an early date, not from forms that were selected for being either generally superior or likely to do well in northern Europe. It was because these potatoes were not well suited to cultivation in northern Europe that the potato was slow to become an important crop. Because these types set tubers late in autumn, crops grown in England and northern Europe often had their top growth killed by frosts before tubers had fully developed.

By the early eighteenth century some development had been undertaken to improve the potato as a food crop. Salaman (1987:160) wrote:

In the early days of the potato in Europe, fortuitous methods at first held sway, but it was not long before skilled cultivators purposely planted the seed from the naturally formed berries, selecting from the resultant seedlings those plants possessing the characters they sought, early or late maturity, long or round, coloured or colourless tubers.

Wilson (1995:13) noted that although the potato was considered to be less important than the radish in 1716, it later came to be accepted as an exotic vegetable for luxury use. By the mid-eighteenth century it was a well-established and accepted food crop. By this time the potato had adapted to the long European growing days and offered real commercial potential. Phillips and Rix (ibid) referred to records showing that growers in the Manchester region in the 1760s repeatedly raised new varieties from seed and competing with one another to get saleable tubers earlier in the summer. By 1770 there were a number of named varieties available but, as noted by Salaman (1987:163), the practice of giving several local names to the same variety meant there were actually fewer different types available.

One of the consequences of this fairly rapid evolution from limited initial importations was that the European potato of the eighteenth and nineteenth centuries had a narrow genetic base (Mackay 1997:564). When late blight, a fungus disease, arrived in Europe in the mid-nineteenth century it decimated potato crops in Belgium, Holland, France and southern England. It then wiped out most of the crop in Ireland in 1845, and almost the entire crop the following year, and again in 1848. These catastrophic events occurred because there was

insufficient genetic variation within the available cultivars for some to resist infection. Consequently, the entire crop was uniformly affected. Keating (1996:8) noted that the effects of the blight in Ireland were particularly tragic because the majority of the population depended almost entirely on the potato as a food source. It was this event that stimulated the scientific world's serious interest in the cultivation of the potato and in the creation of new varieties. Salaman (1987:164) noted:

No spectacular development took place in variety raising until after the crisis caused by the pandemic blight (*Phytophthora infestans*) of 1845 and 1846. The failure of any of the existing varieties to exhibit the least resistance to this new and devastating disease gave both the stimulus and directive force to a new era of plant breeding.

Over time, by unconscious and conscious selection for higher yield, the short-day tuberizing forms of *Solanum tuberosum* subsp. *andigena* that were originally introduced from South America were gradually developed into the day-neutral, high-yielding European *Solanum tuberosum* subsp. *tuberosum* (Mackay 1997:563). The origin and development of the potato can be summed up in this statement by Genet (1983:49):

It is now generally agreed that *S. tuberosum* originated in the Andes of Peru and Bolivia. These potatoes are short-day types and constitute the subspecies *andigena*. Man subsequently introduced them to Chile and after many generations of selection, long day types evolved which are now classified as subspecies *tuberosum*. The early introductions to Europe were most likely subspecies *andigena* and as in Chile, seedlings more adapted to the long day conditions of Europe were selected.

It seems likely that the long-day *tuberosum* types were developed independently in Chile and in Europe.

Potato cultivars available in the United Kingdom in the eighteenth and early nineteenth centuries

By the latter part of the eighteenth century, at the time when the first introductions of potatoes to New Zealand were recorded, the following eight named cultivars were recorded as being available and commonly grown in the United Kingdom. These were listed and detailed with the year of their introduction in the United Kingdom by Wilson (1995:15):

The Howard' 1765; 'White Kidney' c.1765; 'The Irish Apple' 1768; 'Red Nosed Kidney' c.1775; 'The Manly' c.1776; 'The Yam' c.1771; 'Early Champion' c.1787; 'Ox Noble' 1787.

Keating (1996:26) recorded, with their year of introduction, the following potatoes as the main cultivars grown in Ireland at the time of the famine in the mid-nineteenth century. 'The Block' (pre 1730); 'The Apple' 1768; 'The Cup' (pre 1808) and 'The Lumper' 1808. (See Appendix B.)

Introduction of potatoes to New Zealand

There are a number of reported introductions of potatoes to New Zealand in the late eighteenth century, and while scholars often disagree as to the most likely *first* successful introduction, from the available evidence it is probable that there was at least one successful introduction during that period. Listed below are details of reported introductions between 1769 and 1793.

de Surville 1769

It is often reported (Yen 1961/62:2; Smith 1995:85) that potatoes were first introduced to New Zealand by the French explorer, Jean de Surville, who arrived in Hokianga Harbour on 12 December 1769 on his ship *Saint-Jean Baptiste*. However, journals of that voyage (Dunmore 1981:43) indicate that while he introduced wheat, rice and peas as well as pigs and hens, there is no reference to potatoes. This fact was noted by Best (1925:279).

Cook 1769

Thomson (1859:158) reported that during his first voyage to New Zealand in 1769, Captain James Cook gave two handfuls of potatoes to a chief in Mercury Bay, and that Māori recollection of this event indicated these were planted for three consecutive years before being distributed. Leach (1984:98), noted that 'this gift may well note the first successful introduction of a European food plant to New Zealand'. However, Best (1925:282) stated: 'there is no word of Cook having introduced the potato on his first voyage to New Zealand', and in the same paper he further observed 'Dr Thomson's [Thomson 1859] statement that Cook left potatoes with North Island natives during his first voyage is probably an error. He did not provide any further explanation.

Thompson (1988:182) wrote: 'We know the potato was introduced by James Cook and the recorded reminiscences of Te Horeta Taniwha gave an eye witness account of this introduction at Whitianga in 1769.' He also noted that at least one Pākehā historian (presumably Best) disputes the veracity of this record but that other scholars accept it.

Marion du Fresne 1772

Leach (1984:98) noted that 2 years after Cook's visit, Crozet of the Marc Marion du Fresne expedition established the first European garden on Moturua Island in the Bay of Islands in March 1772. In Roux's journal of that expedition (in McNab 1914:399) it was recorded:

As the natives are extremely intelligent, we were able to make them understand that the plantations we had made on Marion Island [Moturua Island], of wheat, maize, potatoes and various kinds of nuts, might be very useful to them... All these plants had grown very well, although it was winter. The natives seemed highly pleased, and informed us that they would take care of our cultivations, but I do not know whether they have preserved all these plants, which would be all the more valuable to them seeing that they have only the sweet potato and fern root.

Leach commented that even though the Bay of Islands was going through a turbulent period, the fact that the potatoes were growing in a model garden would have improved their chances of survival. An early French missionary at Hokianga from 1838 to 1842, Father Catherin Servant, recorded that Māori of that time considered the potatoes they grew came from Marion du Fresne's introduction.

Cook 1773

Several authors recorded and commented on the gardens established at locations in Queen Charlotte Sound during Cook's second visit to New Zealand in 1773. (Bayly in McNabb 1914:207; Begg and Begg 1969:117,122; Barrat 1979:83; Beaglehole 1969:287; Burney in McNab 1914:197 and Barrat 1979:38,44). On Cook's instructions, the crew of the *Adventure* (captained by Furneaux), planted potatoes along with other European vegetables and grains at several locations in Queen Charlotte Sound. Cook recorded:

these potatoes were first brought from the Cape of Good Hope and had been greatly improved by the change of soil, and with proper cultivation would be superior to those produced in most countries.

The potatoes that Cook's expedition procured from South Africa while en route to New Zealand were likely to have been of Dutch origin as stated by E. Joubert 1999 (pers. comm.): 'It can be accepted, with an amount of certainty, that the first potatoes for planting purposes at the Cape came from Holland and were in fact planted here as food for mariners.'

When Cook revisited Queen Charlotte Sounds during his third visit in 1777, Best (1925:281) reported that he found 'not a vestige of the gardens remained and with reference to potatoes that 'though the New Zealanders (Māori) are fond of this root, it was evident that they had not taken the trouble to plant a single one.'

However, this was disputed by Best who wrote:

it is by no means assured that these potatoes were not perpetuated. Any natives seen at the Sound by Cook must have been acquainted with the arts of agriculture and the potato would assuredly appeal to them more than any other of the new food plants. We cannot positively state that the potatoes planted by Crozet in 1772 at the Bay of Islands, and by Cook at Queen Charlotte Sound in 1773 were preserved and propagated by the natives, but it seems highly probable that at least those planted in the northern port were so perpetuated.

W. Harris (1997: pers. comm.) noted that the timing of the Queen Charlotte Sounds plantings by Furneaux (April) would not have been conducive to the production of a potato crop in the Marlborough Sounds. However, Leach (1975:99) pointed out that the potato did survive in the Sounds — as in 1820 the Russian explorer Bellingshausen found that the Māori community at Ship Cove were growing potatoes for their own consumption. Leach also referred to a garden planted in 1773 at Pickersgills Harbour, Dusky Sound, on the instructions of Cook, although less than 20 years later Dr Archibald Menzies reported no signs of introduced European plants at this spot.

During his visit to New Zealand in 1813 the Rev. Samuel Marsden commented on the extent to which potatoes were cultivated by Māori, and stated that the official introduction of the potato was credited to Lt King, Governor of Norfolk Island, who visited the far north of New Zealand in 1793 and gave the natives various seeds and implements (Elder 1932:526). However, according to Best (1925:282), King's journals do not mention potatoes at all.

Table 1

Eighteenth-century introductions of potatoes to New Zealand, as reported by Leach 1984, Best 1925, Elder 1932.

Year	Name	Location of reported introduction
1769	de Surville	Doubtless Bay, Far North.
1769	James Cook	Mercury Bay, Whitianga.
1772	Marion du Fresne	Moturua Island, Bay of Islands.
1773	James Cook	Marlborough Sounds and Dusky Sound, Fiordland.
1793	Lt Governor King	Bay of Islands

Sources: Leach 1984, Best 1925, Elder 1932.

Following these early introductions it is likely that there were many more introductions of potatoes. Genet (1996:30) wrote that whalers and sealers introduced potatoes and often, because of the plant's ability to perpetuate itself and provide nutritionally good food, planted them as a food source for shipwrecked sailors. Yen (1961:2) noted that there were opportunities for considerably more introductions of potatoes from '...diverse and interesting directions' during the early settlement period in the nineteenth century and that:

This South American plant travelled many routes to reach New Zealand. Not only could they have come with the settlers who would have brought established Western European varieties, but also some from South Africa (Cook's early introduction is recorded as being of South African stock). Perhaps the whalers who ranged the Pacific at this period had the opportunity of bringing the most interesting material. As ship's stores, potatoes could have been brought from North, South and Central America since Callao in Peru and Acapulco in Mexico were provisioning ports for whaling vessels, many of whose home bases were in the eastern U.S.A. Records of their chance introductions may never be discovered.

Leach (1984:127), in writing of edible plants that have had a long association with New Zealand, wrote: 'Although potatoes are residents of a mere 200 years, standing, they are intrinsically interesting survivors of the days of exploration, whaling and sealing.'

Pre-European potato introductions

While it is generally accepted that potatoes were introduced to New Zealand by Europeans, some Māori maintain that they were introduced to New Zealand by their own ancestors along with the kūmara, although there is no firm evidence that this was so. Hammond (1894:237–8) recorded that Māori on the Pātea coast said they had several varieties and referred to an ancestor, *Te Reke Tatairongo*, who obtained a tuber from the ‘hidden world’ which he cultivated and distributed among his people. Hammond noted that the *Tatairongo* potato was still cultivated (1894) at Pātea and Waitōtara. He also listed 15 named varieties which were cultivated before the introduction of European varieties. In a footnote to Hammond’s paper (published in the *Journal of the Polynesian Society*), the editors noted that they had been told by *Te Karehana Whakataki* (living at Porirua) and by *Rangipito* (living in the Hutt Valley) that Māori possessed potatoes before the arrival of Europeans. Both men gave the names of several varieties of pre-European potatoes grown by Māori. The editors however, noted:

In giving this information, these old men intended to imply that the Maoris possessed these varieties before the times of Captains Cook and De Surville, but it seems to us questionable if they are not varieties produced from those brought here by those two navigators.

Best (1925:284) recorded:

In the Bay of Plenty district it is a popular belief that the araro and rokoroko varieties of the potato (*Solanum*) were cultivated there prior to the arrival of Europeans, but old Tutakangahau of Maunga-pohatu stated that they were obtained during the early years of intercourse with Europeans.

In ‘*Song of Waitaha*’, a collection of the teachings of Iharaira Te Heihana, Brailsford (1994) recorded several references to the Waitaha people’s claim to have introduced the potato to New Zealand/Aotearoa from Waitangi ki Roto, their ancestral homeland. Along with the kūmara and other introduced plants, he refers to ‘... peru, the potato which went happily to new soils’ (p. 136) and he recorded descriptions of several varieties (p. 143):

In the fine soils below makomako we planted the small black potato, the old one named peruperu that needs less water than the others. Its neighbour was the little yellow potato, the taewa that gave great energy to those doing heavy work. On the middle slopes were the small kumara and the big red potato called parete.

Best (1925:284) doubted that Māori possessed potatoes before the arrival of Europeans and commented:

If the potatoes planted in Queen Charlotte Sound by Cook in 1773 were perpetuated, then the tribes of Cook Strait must have cultivated them for nearly fifty years before the coming of whalers and traders. Little wonder they claim a pre-European potato.

While claims of pre-European potatoes persist, and there is some anecdotal evidence as to their existence, some facts that indicate Māori were unlikely to have possessed potatoes prior to their introduction from Europe include:

1. The introduction of the potato from Europe in the late eighteenth century had an immediate and profound effect on Māori society (see 'Adoption of the potato by Māori').
2. There is no scientific evidence (such as pollen records or the discovery of remnants of early carbonised potato tubers) to indicate pre-European potatoes.
3. Early European explorers, whose expeditions included competent botanists who kept detailed records, found no evidence of pre-European potatoes.
4. Other plants introduced by Māori, including kūmara *Ipomoea batatas*, taro *Colocasia esculenta*, yam *Dioscorea alata*, hue *Lagenaria siceraria* and aute *Broussonetia papyrifera* were from the warm, humid tropics. The potato, however, although of tropical origin, was a high altitude plant which would not have grown successfully in the warm humid conditions of tropical Polynesia.

Māori-developed cultivars

It seems likely that Māori developed some cultivars by sowing true seed of the potatoes that were available to them and making selections from the seedlings. This was reported by Colenso (1880:14), who noted:

The northern tribes, especially the Ngapuhi, had more than forty years ago, obtained several new varieties of potatoes by sowing its seed; to which, however, they were first led by accident, having noticed some young plants which had sprung from self-sown seeds of the ripe potato berries and from them they had obtained several good and prized sorts.

Yen (1988:39) also referred to the Māori development of cultivars. He noted that, while the many potato varieties grown by Māori were regarded as simply relicts of direct and early European introduction, a Mrs Henare spoke of 'potato apples with seed' in reference to her plantings of potatoes at Motatau in Northland. He suggested that, through Māori selection, these potato seedlings produced the Māori varieties. He described this as 'a redomestication'. Salaman (1987:159) noted that this practice by native cultivators of intentionally raising new potato varieties by sowing true seeds from the potato berry, has been undertaken for many years, and referred to Colombian native people who collect potato berries, from the Andes mountains, 'selecting from the seedlings the better types and the heavier yields'.

Observations by the present author while growing 18 varieties of Māori potatoes for three seasons indicate that few of these types actually set seed. While all varieties produced flowers each year only four varieties set seed during this period. This observation was confirmed by Salaman (ibid.) who noted that in Europe (the source of potatoes introduced to New Zealand) fruit-bearing varieties were not common due to a dominant mutation which occurred after its introduction (to Europe and the United Kingdom), which inhibited the full development of the anthers.

While it is possible that some of the potato varieties perpetuated by Māori resulted from intentional seedling selection, Yen's apparent claim that all or most of these varieties were produced by this method is unlikely, as there are no records of the practice being widespread (it has been recorded as having undertaken only by northern iwi) and few seed-bearing varieties would have been available.

Adoption of the potato by Māori

Effects on Māori society

Māori were quick to recognise the advantages of the introduced potatoes over the kūmara. They were easier to grow, yielded more heavily and were easier to store. Yen (1961:4), in referring to the introduction of the potato, considered that agriculturally the impact of the plant must have been spectacular.

Best (1925:284), in reporting accounts of the voyage of the *Venus* (1836–39), wrote:

the Maori certainly appreciated the potato and it is at the present time his most favoured food supply. When he found that it not only suited his palate, but was also most prolific and was capable of being cultivated to advantage at all altitudes and at all places occupied by the native people, he recognised its great superiority over the kūmara, which requires much more care in its cultivation.

The significant impact of this introduction on Māori society was recorded by Firth (1929:488), who wrote:

The results of the introduction of the potato bring out with clarity, the manner in which new culture items affected the economic life and even the environment of the native. The potato is of such hardy nature that it can be grown in all districts and moreover it is prolific, yielding a plentiful return for the labour expended. Hence it was speedily introduced into districts which like Tuhoe had formerly possessed no cultivated foods and also tended to replace the kumara among other tribes. Again it effectively supplanted the aruhe, the fern root (*Pteris esculenta*) as one of the staple vegetable foods.

Firth also considered some negative aspects of the introduction of the potato on Māori society and on the environment. He noted that formerly the forest had been strictly conserved as a source of wild foods such as berries, birds and rats. However, following the introduction of the potato, this care became unnecessary and year after year more forest was destroyed to make way for potato plantations. Cameron (1964:98) wrote of destruction of indigenous forests by Māori agriculturalists of the nineteenth century:

The introduction of the potato to New Zealand at the end of the eighteenth century caused considerable changes in Maori agriculture. There was a great expansion in shifting cultivation over forest land and there are records of Maori fires having destroyed very large areas of forest.

Firth suggested that, because cultivation and production of the potato crop required less care and attention, there was more time for other less energetic

pursuits. He considered that this contributed to a general decline in physical fitness of the race. Belich (1996:159) in writing of Māori warfare, considered that the introduction of the potato (and the pig) gave Māori a reliable surplus, helped in feeding long-range expeditions and meant that because less labour was required for food production, warriors were available to take part in warfare expeditions. He suggested that in 1818 acreages of potatoes and other crops may well have become really substantial and reliable among the Northland groups and noted that — ‘Potato wars’ might therefore be more accurate than ‘Musket wars’ — a suggestion that the potato’s part in Māori warfare was at least as significant as the musket.

Māori production systems

Because the method of propagation and production of the potato was similar to that of kūmara, it was able to fit into the existing agriculture system of the Māori with little modification. Best (1925:99) described methods of planting potatoes that were identical to those used for kūmara. He noted that the implements used for cultivation, and the ceremonial rituals, were also the same. Potatoes were particularly welcome in the southern regions of the South Island where kūmara would not grow. Records show that the early potatoes grown by Māori in Otago and Southland were grown on mounds according to traditional kūmara culture, and it is suggested they were introduced to the south by Ngāi Tahu from the Kaikoura region who were known to raise kūmara.

While Best and others have said that Māori adapted kūmara production methods to growing potatoes, Cameron (1964:102) pointed out that this is not strictly correct. He noted that the two vegetables require different soil conditions with kūmara growing best on warm, well-aerated soils while potatoes prefer cool moist soils and will not grow well on the same soils year after year. For potato production new land was used at least every second year, and this made greater inroads into the forest than had kūmara production which involved using the same piece of land for several years.

Māori also developed innovative cultivation methods. Best (1925:285) recorded that the Māori became adept in the cultivation of the potato and adopted some methods not employed by European settlers. He wrote:

in order to obtain a very early crop he planted seed tubers as early as June in scrub land or light bush, then felled the bush which was burned in early spring. The fire destroyed the haulm of the plants that had grown up through the felled timber, but a new growth soon followed, whereas exposure to frost would have spoiled the crop. His method is called *whakapara* in the Bay of Plenty and *whakaota* at Taupo.

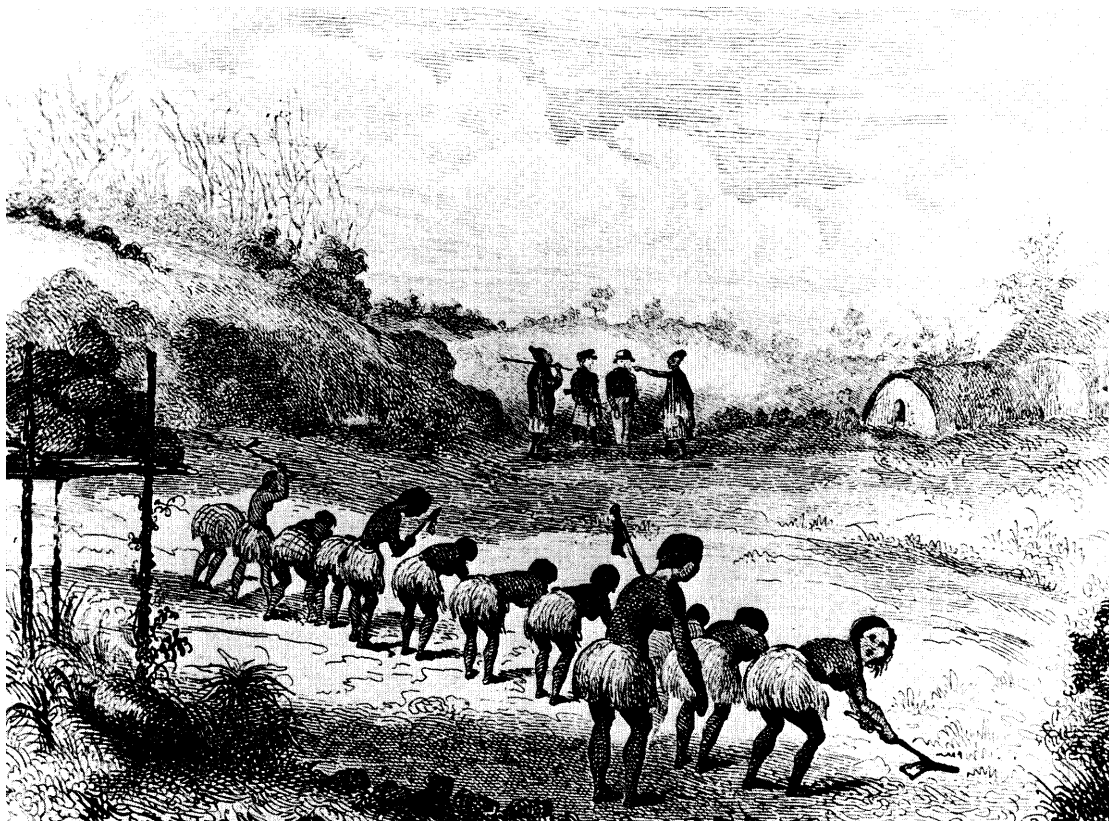
Leach (1984:109) in referring to new plant introductions including the potato, noted that by the nineteenth century Māori were using the new plants to great advantage and that the new plants and tools were slotted into place within the traditional systems. She described Māori gardening of the time as 'a robust and adaptable tradition.' In writing of acceptance of new crops in Polynesia, Leach (1983:145) stated:

Forty years after the Maoris' first exposure in Northland to European plants, the five pre-European food plants were still grown but had been joined in Maori gardens by two other root crops, potatoes and turnips, by a green crop cabbage and by the tall maize. The most successful introduction of all was the potato...

By the early 1800s Māori were growing large crops of potatoes, and an area of 50 hectares in potato production was not uncommon. An article titled 'Historical records of New Zealand South,' in the *Sydney Gazette*, September 1813, records the visit that year of a flax dresser, named Williams, to the Bluff. Best (1925:285) quotes this article when he says:

The natives attend to cultivation of the potato with as much diligence and care as I have ever seen. A field of considerably more than 100 acres presented one well cultivated bed, filled with rising crops of various age, some of which were ready for digging, while others had been newly planted. Dried fish and potatoes form their chief support.

While it is well documented that by the early part of the nineteenth century, the potato was grown extensively by Māori, at this period they still relied principally on traditional food crops, and Shawcross (1967:333) contended that it was not until after 1820 that introduced food crops displaced fernroot (*Pteris esculenta*) as the principal staple food item in the diet of the Māori. Hargreaves (1963:104) considered that by the 1830s the potato was the basic food crop of New Zealand, 'preferred by the Maoris above all their traditional crops.'



'Défrichement d'un champ de patates' ('Digging a field of potatoes'). Women working with the *kō*, digging sticks. This lithograph by Louis de Sainson, published in 1839, derives from the voyage of the corvette *L'Astrolabe* to New Zealand in 1826–27. It gives the impression that the women are being supervised; they may be war-captives. The taking of captives, so as to increase the labour forces available to produce food for the ships, developed extensively in the north during the 1820s.

Fig. 2

Source: Binney, J., Basset, J., Olsen, E. *The people and the land Te Tangata me te Whenua: An Illustrated History of New Zealand 1820–1920*. Wellington: Allen and Unwin NZ, 1990: p. 22.

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Storage methods

Similar storage methods to those developed for kūmara were used for overwinter storage of potatoes. Leach (1979:112–113) described a circular raised-rim storage pit on a bank of the Mākotukutuku stream in Palliser Bay. He interpreted this as a potato store that was probably in use in 1840 when it was recorded that potatoes were grown in the area. A layer of fern stalks was found on the floor of the pit. Leach noted 'the use of fern as a floor covering suggests a continuation of an earlier practice designed to keep tubers off the damp floor of storage pits.' Describing numerous potato storage pits at

Waimate, Marshall (1836:21) recorded they were 'found in all directions as to completely honeycomb the whole of the ground.' He described these potatoes as being for consumption, while seed potatoes were put in baskets covered with fern.

Māori also stored potatoes on raised platforms called *whata*. Savage (1807:56) remarked 'their mode of preserving them is upon a platform erected on a single pole, about ten feet in height.' Marshall (1836:170) made similar observations and referred to 'several *wata* or stages, supporting baskets of seed potatoes carefully sewn up with dried grass and covered with fern leaf.

The practice of covering stored seed potatoes with fern leaf is interesting as the practice is still undertaken today by Māori in Northland. The following explanation was given by a kuia (elderly woman) at Motatau. 'The dust from the fern leaves keeps the riwai healthy.' She further explained that the fern must be mamaku (*Cyathea dealbata*) and that wheki (*Dicksonia squarrosa*) should be used for kūmara storage. Presumably the 'dust from the fern leaves' she referred to is fern spores.



Fig. 3 Fern covering potatoes in storage

Cooking methods

Iron pots were not common in Māori villages until the 1830s (Leach 1984:106) so potatoes were initially cooked using traditional methods. Leach noted that until the iron pot was commonplace 'vegetables which most appealed to cooks were those that could be prepared in traditional ways, either roasted over embers, eaten raw or steamed in the earth oven'. The method of cooking using an earth oven was described by Leach (1982:152–154). Thomson (1859:159) considered that prior to the introduction of iron pots

The science of cookery was in a primitive state among the New Zealanders, for being destitute of vessels capable of resisting fire, the cookery of the whole race, except for those living near the boiling springs at Taupo or Rotorua was limited to steaming and roasting.

He went on to describe the earth oven. He also described the method of roasting: 'Roasting was effected by placing the articles near fire, but the New Zealanders despise this mode of cooking, and called it a make-shift, a dinner for slaves or men in a hurry'.

By the 1830s, boiling in iron pots appeared to have become a common method of cooking potatoes. Marshall (1836:70) observed a couple of women boiling potatoes on an English swing pot and commented:

...the lately savage inhabitants of a savage country, not only feeding on a root for which they were indebted to an Englishman, but also cooking it after the English fashion in a vessel of English manufacture.

Riley (1994:425) described a unique water steeping method used as an alternative method of preparing potatoes for eating.

The potatoes remain submerged for five or six weeks, depending on the quality of the water and the variety of potato. They became very white and pulpy in this time, and if correctly treated would have no offensive smell. After the skins had been peeled off, they were made into cakes and cooked in the ashes of a fire. Wild honey was sometimes added to these *kotero taewa* or *kopi taewa*.

The potato as a trade commodity

As well as becoming the staple item in the diet of the Māori, it is well documented that potatoes became an important trade commodity, not only within Māori communities but for European colonists and for provisioning European ships. (Cameron 1964; Grey 1994; Hargreaves 1959, 1963; Watson and Patterson 1985; Belich 1996). Evison (1993:28) noted that by the 1840s, Māori agricultural production was based mainly on potatoes; wheat was thriving in

Otago and Southland and several Māori groups were operating their own sailing vessels to transport their crops. Murihiku (Southland) potatoes were regarded as being of particularly good quality and were in demand in the population centres further to the north.

The Chatham Islands also became an important region for potato production. When the Taranaki tribes, Ngāti Tama and Ngāti Mutunga, sailed on the ship *Rodney* to colonise the Chathams in 1835, 78 tonnes of seed potatoes were included in their provisions. (King 1989:59). During the 1850s and 1860s Māori on the Chathams were producing 'hundreds of tons', much of which was exported to Australia.

In the early nineteenth century when Māori realised that potatoes were a valuable trade commodity, it appears that they would store them for this purpose rather than eat them. Savage (1807:56):

Though the natives are exceedingly fond of this root, they eat them but sparingly, on account of their great value in procuring iron by barter from European ships that touch at this part of the coast. The utility of this metal is found to be so great that they would rather suffer almost any privation, or inconvenience, for the possession of it particularly when wrought into axes, adzes or small hatchets: the potatoes are consequently preserved with great care against the arrival of a vessel.

Sometimes, Māori were so anxious to conduct trade that potatoes were often dug before the tubers were fully developed (Hargreaves 1963:105).

By the beginning of the nineteenth century McNab (1914:108) considered that Māori agriculture was becoming commercialised and 'losing its wholly subsistence nature'. He noted that extensive fields of potatoes were being grown in the Thames area and he referred to the purchase by a trading vessel from New South Wales of some seven to eight tons of 'very fine' Māori-grown potatoes.



Gilfillan called this pencil drawing 'A settler bartering tobacco for potatoes and pumpkins'. A piglet is also on offer.

Fig. 4

Source: Binney, J., Basset, J., Olsen, E. *The people and the land Te Tangata me te Whenua: An Illustrated History of New Zealand 1820–1920*. Wellington: Allen and Unwin NZ, 1990: p. 86.

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Māori production of potatoes continued to increase into the nineteenth century, and in 1834 Edward Markham (a naval officer and adventurer) saw a store of 4,000 bags of potatoes in one Hokianga village which Cameron (1964:103) estimated to be about 100 tons. Hargreaves (1959:61) wrote that Māori-grown produce played a significant part in feeding the European population of Auckland Province and provided an important contribution to exports. While no statistics are available for the Auckland region for the period, in 1857 the *New Zealander* (Hargreaves 1959:5) recorded that 3,050 acres of potatoes were grown in the Lakes (Rotorua) and Bay of Plenty districts. Watson and Paterson (1985:525) recorded that in the Wellington region in 1847 'Maoris dominated the market for pigs, potatoes and sea food.' Māori-grown produce from all over the region was transported to Wellington, and in 1841 pigs and potatoes from inland Wanganui were canoed down river then transhipped to Wellington.

Māori food production (of which potatoes were the major commodity) peaked in the late 1850s and declined precipitously thereafter (Grey 1994:204). The land wars of the 1860s and subsequent loss of productive land is often regarded as the cause. However, Hargreaves (1959:76) wrote:

Although the Maori Wars of the early 1860s are often regarded as the cause of the decline of Maori agriculture, particularly in the Waikato and Bay of Plenty, it is suggested here that in reality they only gave the final death blow to an already waning industry. This decline was in part due to a lower quality product less efficiently prepared for the market than that which the European farmer was producing or which could be imported relatively cheaply; and in part due to a general disillusionment and loss of interest in the European's ways, including his agriculture, in the rising tide of Maori nationalism.

Characteristics of Māori potatoes

In the *Dictionary of New Zealand English* Orsman (1997:480) described Māori potatoes as

Any of several varieties of mealy potatoes with reddish or purple skins and some interior colouration, grown originally and traditionally by the Maori, the present varieties possibly descended from stock introduced in the late 18th or early 19th centuries.

Yen (1961:4) in describing Māori potatoes noted 'In such characters as plant habit and vigour, flower colour, tuber shape, colour and texture, the Māori varieties exhibit a considerable range in variation.'

Flesh type varies greatly, and ranges from the hard waxy (low dry-matter content) 'Huakaroro' which remains firm when boiled, to the floury textured (high dry-matter content) 'Urenika' which tends to disintegrate when boiled.

Figures 9 and 10 (at the end of this section) show that the tubers of the various Māori potato cultivars vary. They range from spherical, through flat oval, to elongated shapes, and they generally have a knobbly appearance with very deep set eyes. Skin colour varies greatly while the colour of the flesh includes white, yellow and purple. Some cultivars have coloured flesh inside the vascular ring and white outside it (See Fig. 6).



Fig. 5 Urenika flesh

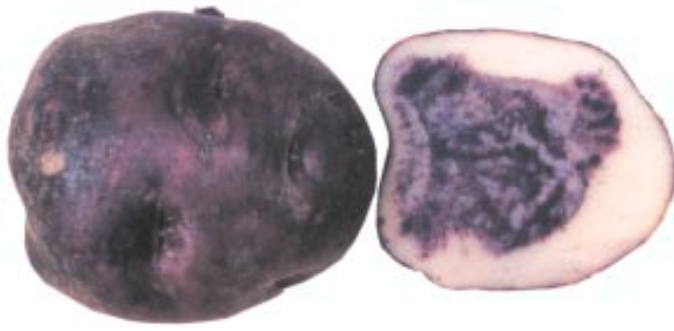


Fig. 6 *Karupoti flesh*

Blue is the most common flower colour, ranging from the light blue of 'Moemoe', through to the mid-blue of 'Māori', to the dark blue of 'Raupi'. 'Karupoti' has very large white flowers while 'Urenika' (Fig. 12) and 'Pāwhero' have cream flowers with grey/brown striations on the inner parts of the petals. Most cultivars develop tubers at the ends of long stolons and they tend to set tubers in autumn when days are shortening. Some, such as 'Uwhi', 'Whataroa' and 'Urenika', set small tubers in the axils of the leaves at the same time as they are developing subterranean tubers (see Fig. 7). The haulms (tops) of the plants vary in appearance; and some cultivars develop short upright stems while others have long and prostrate stems.



Fig. 7 Some Māori potato cvs such as 'Urenika' develop small tubers in the leaf axils

Māori potatoes appear to have some resistance to certain diseases which affect 'modern' potato cultivars and Yen (1961/62:5) wrote:

The Maori claims that their potatoes are resistant to diseases appear to have some foundation since their perpetuation has been accomplished to the present day without the aid of any form of disease control. In preliminary experiments, the potato and vegetable sections of this division [*Crop Research Division of the New Zealand Department of Scientific and Industrial Research*] have found that varying degrees of resistance to blight and some viruses exist in over 20 of these varieties.

In referring to Māori potatoes, Genet (1985:23) noted that 'early introductions were of diverse origins; often of *andigena* types, and some still survive.' Certainly, from the characteristics described above it is apparent that the Māori potatoes have many similarities to the *andigena* types grown in the United Kingdom in the late eighteenth and early nineteenth centuries — at the time when many of those cultivars were likely to have been introduced to New Zealand.

Yields of Māori potatoes

The yields obtained from Māori potatoes are generally low compared to those from modern potato cultivars. Genet (1984:32) noted:

yields are usually quite low by today's standards but some of this can be attributed to viruses contained in many of these varieties. Grown in good free-draining, but well watered soils yields are acceptable.

Most of the Māori potatoes appear to be relicts of European cultivars dating from the eighteenth and nineteenth centuries, and Burgess (1987:21) noted that in 1894 the yield was only 15 tonnes per hectare compared to around 40 tonnes per hectare today. Williams (1993:142) considered that, today, yields of over 100 tonnes per hectare are possible. This is due to more productive varieties and improved growing techniques.

To compare the yield of Māori potatoes with that of a modern cultivar, an informal trial was conducted over three seasons. Eight Māori cultivars were grown in a plot alongside a 'modern' cultivar. The modern cultivar selected was 'Rua', which was certified in 1966 (Genet 1983:55). It was selected because it is a 'late' type — setting tubers in autumn at a similar time to most of the Māori types. Six plants of each cultivar were grown. A formalised random layout was not used as the purpose of the experiment was to be indicative only. The first trial was planted at Upper Hutt, on a clay loam soil, on September 28 1996, and the tubers were harvested on 28 March 1997. The second planting was at Martinborough, in the Wairarapa, on a silt loam soil. Tubers were planted on September 25 1997, and harvested the following year on 26 March. The final planting was at Moiki, near Greytown, in the Wairarapa on a silt loam soil. Tubers were planted on September 26 1998, and harvested on March 28 1999. Results (yield in kg per plant) are summarised in the following table. For the purposes of calculating average yield, the Māori cultivar 'Kowiniwini' was not included as these plants showed obvious signs of virus infection (mottling, crinkling and slight yellowing of the leaves — typical symptoms of potato virus Y) and the yield per plant was much lower than that of the other cultivars.

Table 2

Yield per plant (kg) averaged over 3-yearly crops of 8 Māori cvs and one 'modern' cv.

Cultivar	1997	1998	1999	average yield
Karupoti	0.75kg	0.64	0.82	0.73
Kowiniwini	0.31	0.36	0.41	0.36
Pāwhero	0.94	0.87	1.08	0.96
Poiwa	0.62	0.79	0.59	0.67
Ngā Oti Oti	0.50	0.61	0.48	0.53
Raupi	0.88	0.93	0.82	0.88
Urenika	0.58	0.69	0.60	0.62
Moemoe	0.75	0.93	0.79	0.82
Rua	1.40	1.79	1.39	1.52

Results indicate that 'Rua' consistently produced a considerably greater yield than the Māori cultivars over the three seasons. The average yield of the Māori cultivars was 0.74 kg per plant while the average yield for 'Rua' was more than twice that at 1.52 kg per plant.



Fig. 8 *Informal trial plots*

The Māori potato today

A wide range of Māori potatoes are still grown today in many parts of New Zealand. Orsman (1997:480) observed that they are still found growing in some home gardens, more especially in the rural areas of the north. While they are mainly grown by Māori families, there are numerous Pākehā enthusiasts maintaining Māori potato collections, and a collection is maintained by the New Zealand Institute for Crop and Food Research at Lincoln. Part of the justification for maintaining this collection is to provide a broad gene pool for possible use in potato breeding programmes (Genet and Anderson 1985:28).

While Orsman's selected quotations tend to show that these potatoes are mainly grown in the rural north, they are also grown by numerous Māori families on the East Coast of the North Island — mainly in the East Cape/Gisborne/Hawkes Bay areas — but also in the Bay of Plenty and, to a lesser extent, on the west coast from Taranaki to Wellington. They are also grown in some rural areas in the Waikato. Some are grown in the South Island and there are Māori families on the Chatham Islands still maintaining the old cultivars. In fact, in any rural area where there are groups of Māori people, these potatoes can be found in their vegetable gardens.

Māori potatoes, being relicts of cultivars introduced from Europe in the late eighteenth and early nineteenth centuries (with some possibly having been developed by Māori selection from seedlings), have been maintained within whānau (families) for possibly over 200 years — perhaps eight to nine generations. Most of the Māori families visited as part of this study who were growing the old cultivars, were also growing 'modern' cultivars for their greater yield. Various reasons were given for maintaining the old cultivars but the main reason appeared to be that, because these tubers had been passed down through the generations, there was a responsibility to maintain them and continue to pass them on. Several people referred to them as a *taonga* (something highly prized or treasured) that had been left to them by their *tipuna* (ancestors). Obviously these plants have a value to some Māori that is more than their value as a food source. There is precedence in history for this concept, and Leach (1989:35) in referring to the low yield provided by the kūmara in pre-European Māori horticulture, noted:

Value may be a measure of religious significance, of social or ceremonial meaning, or of sentimental importance... to the Maori, the kumara's non-economic values so clearly outweighed its poor yields that they persisted in growing it.

In this context, it seems likely that the old potato cultivars have at least sentimental value.

Roskruge (1999:3) reported that taewa (Māori potatoes) are grown (by Māori) as a regional speciality to show a host's hospitality, as a reason for *whanaungatanga* — working together as a community. He also considered that, in addition to their importance in Māori culture, they could be of commercial value. Certainly today there are numerous community and marae-based groups growing the old varieties for sale at markets and roadside stalls, and growers have reported that they have no problems in selling all they can produce — usually at a considerable premium above that paid for 'modern' potatoes.

Yen (1961/62:4) in writing of the present-day survival of Māori potatoes, stated:

They are grown annually in small household garden plots and many varietal names are known. They form a minor part of the diet but are regarded to be of better culinary quality than modern commercial varieties.

Some Māori consider that the old potatoes have a better taste than 'modern' types and as the many cultivars still grown have a range of culinary properties, it is likely that some may well be considered to be superior in this regard. Certainly the hard waxy types such as 'Huakaroro' are considered to be better than modern types for boiling with meat such as pork, and greens such as puha *Sonchus oleraceus* and watercress *Nasturtium officinale*.

Names of Māori potatoes

In writing of the adoption of the potato by Māori, Yen (1961/2:4) stated: 'Further evidence of the adoption of the potato by Maori may be seen in the conferring of varietal names by the Maoris.' Some conferred names were descriptive, while others were names of traditional root crops which were transferred to varieties of the potato as the people saw similarities (M. Parsons 1996: pers. comm.) In the preface to his dictionary, *A Dictionary of the Maori Language*, Williams (1971) justified the large numbers of names of flax, kūmara and potato varieties in the dictionary by saying:

Many of these words are purely fanciful, or of limited local use; at the same time some are interesting, and in the case of the potato, afford examples of the habits practised by the Māori in giving names, apparently of Polynesian form, to introduced objects.

Generic names

Generic names were also given to potatoes, and in the north of the North Island they are generally known as *riwai* or *peruperu* (P. Niha 1996: pers. comm.) Orsman (1997:686) referred to *riwai* as a possible loanword. *Peruperu* is named after the white throat feathers of the tui.

On the East Coast potatoes are known as *parareka* (D. Para 1999: pers. comm.) This name is also applied to the starchy rhizomes of the horse-shoe fern *Marrattia salicina*, which was cultivated by Māori as a food source — an example of the name of a traditional root crop being applied to a potato variety. In this context the prefix *para* usually means an 'edible tuber' (it is often applied to those of various edible fern tubers or rhizomes) while *reka* means 'sweet or palatable'. 'Parareka' is also a name given to a specific Māori potato cultivar.

Taylor (1858:37) recorded that in the Cook Strait region potatoes were known as *taewa*. Hammond (1894:238–238), in writing of Māori potato production in Taranaki and Porirua, also referred to potatoes as *taewa*. Today, this name appears to be used from Taranaki to the Cook Strait region and also on the Chathams — perhaps reflecting the colonisation of these islands by iwi from Taranaki in 1835. *Taewa* means 'foreigner' which may indicate the foreign origin of the potato. Another explanation (Orsman: *ibid*) is that the word represents the name of one Stivers, who is said to have visited the Bay of Islands before Cook. Stivers is also mentioned by Elder (1932:208) in his letters and journals of Samuel Marsden. He recorded in a footnote: 'Staivers (*sic*) — hence another name for the potato, *taewa*, since he apparently supplied some seed.'

The Ngāi Tahu people of the South Island refer to the potato as *māhētau* (Potiki 1996:30; Beattie 1920:463). *Māhētau* means ‘like a string of fishing sinkers’, referring to the numerous tubers on the ends of long stolons which are apparent when the plants are lifted at harvest time. There are other names used as generic names by Māori for potatoes, but those described above appear to be the most common.

Varietal names

Māori gave numerous varietal names to potatoes, and the same potato was often given different local names. Biggs (1987:146), listed 53 Māori varietal names for potatoes although some of these may well be synonyms. Some of the early cultivar introductions, like ‘Early Rose’ and ‘Skerry Blue’, which were adopted by Māori, have been grown for many years by Māori families, and in some instances they appear to have retained those names although it is likely they were also given Māori names. Beattie (1920:462) recorded that the English cultivar ‘Derwent’ became ‘Kopara’ or ‘Katote’, ‘White Rock’ became ‘Waitaha’, ‘Old Red’ became ‘Pāwhero’ and ‘Red Rock’ became known as ‘Wherei’.

Some of the names were descriptive, for example ‘Karupārera’ means ‘eye of the duck’ as does ‘Kanohi Pārera’. ‘Karupoti’ is ‘eye of the cat’ (*poti* is a transliteration of ‘pussy’). When this potato is cut in half, it has a purple centre within the vascular ring with creamy white flesh around the outside. It has the appearance of a cat’s eye. ‘Huakaroro’ or ‘egg of the seagull’ is usually abbreviated to ‘Karoro’ and is sometimes called ‘White Māori’. The name of the cultivar ‘Moemoe’ means ‘to sleep’ which possibly refers to planting the tubers in the soil. ‘Raupi’ is to ‘cover up’ which may have similar connotations. ‘Whataroa’ may be derived from the *whata* or platform on which potatoes were placed on for short-term storage (see ‘Storage methods’ earlier in this paper).

The name of the very commonly grown ‘Urenika’, which has elongated tubers with dark purple skin and flesh (see Fig. 4), is derived from *ure*, (penis), and *nika* (a Māori transliteration of the derogatory name ‘nigger’ used by crew on American whaling ships to refer to fellow crew members of African descent). This name is thought to originate from the early to mid-nineteenth century when African-Americans were often members of American whaling ship crews (W. Harris 1997: pers. comm.). ‘Urenika’ is also known as ‘Keretawha’, ‘Tuarua’, ‘Waikato’ and ‘Ringaringakatira’ (Genet 1996:32). There are numerous examples of synonyms, as Māori often gave different ‘local’ names to the same cultivar. But some cultivars that may appear to be the same when the most obvious morphological features are compared can be quite distinct types. For example, ‘Poiwa’ and ‘Ngā Oti Oti’ have very similar tubers, leaves, flowers and growth

habit. However, the tubers of 'Ngā Oti Oti' have white flesh which becomes floury when cooked, while those of 'Poiwa' have a slight yellow tinge to the flesh, are more waxy and remain quite firm after boiling. 'Moemoe' also appears to be similar to 'Poiwa' and Ngā Oti Oti' although it grows more vigorously and produces larger tubers.

'Uwhi', a potato grown through the winter in Northland in the early nineteenth century was a name transferred from the yam *Discorea alata* — a pre-European introduction. 'Uwhi' is similar in shape and colour to the yam. It is often referred to as 'Uwhiwhero' (*whero* means red). 'Ngāngārangi' (another name for yam) was also transferred to a potato cultivar. Some potatoes were named for the way they resembled pre-European kūmara varieties. Two examples are 'Katoto' and 'Pōranga' (Williams 1971:104; 293).

The meanings of some commonly grown cultivars such as 'Kowiniwini' (also known as 'Kaupari') and 'Poiwa' are not known. K. Prime (1999: pers. comm.) noted that some words relating to potato varieties and to potato culture are slowly dying out and becoming lost because many Māori no longer have gardens and the words are no longer used.

Acquisition of cultivars

The present collection of 18 named Māori potato cultivars and several unnamed types was acquired over 3 years from a variety of sources. The first three cultivars were contributed in 1996 by Poai Pakeha Niha from Whangarei. The following year Poai Pakeha accompanied me on a journey around Northland, during which we visited several elderly Māori people who grew Māori potatoes. On that journey several more cultivars were collected and information was gathered. Further cultivars were obtained from Dr Russell Genet at the New Zealand Institute for Crop and Food Research at Lincoln in Canterbury. Some cultivars were purchased from roadside stalls and from weekend markets.

Articles published in the *New Zealand Gardener*, *Te Karaka* and the *Dominion* (see appendices) prompted numerous responses and a number of potato tubers were contributed to the collection by both Māori and Pākehā people as a result. Tubers of some unnamed acquisitions were compared with those in the collection and matching types were grown alongside named cultivars to compare other morphological features. Tubers were acquired from all over the country including the Chatham Islands and Stewart Island. Most of the potatoes that were sent were the same as those already in the collection but some were new types. Observations indicated that the most commonly grown Māori potato cultivar is 'Urenika', followed by 'Moemoe', 'Huakaroro' and 'Peruperu'.

It is important to note that some cultivars contributed by Māori were given on the condition that they were not to be used for commercial purposes and not to be given to others without consultation. These conditions have been respected and complied with.

Description of cultivars

Following are descriptions of the 18 named Māori potato cultivars collected as part of this study.

‘Moemoe’

One of the more commonly grown of the Māori potatoes, this cultivar is also known as ‘Mui Mui’ and ‘Ngā Toko’. Tubers are round-to-slightly-elongated and have a yellow-and-reddish mottled flesh and deep-set eyes. The flesh of the tubers is yellow and there are often purple flecks around the vascular ring. They are a waxy potato which remains firm after boiling. The plants have small, dark green leaves and the flowers are light blue.

‘Karupoti’

This potato has round-to-oval tubers which have a dark red skin and moderately deep-set eyes. The flesh colour within the vascular ring is a dark reddish purple surrounded by white flesh (see Fig. 6). The name ‘Karupoti’ (‘eye of the cat’) is derived from this feature. The potatoes become floury when cooked, indicating they are low in moisture and sugar content, and high in starch. They tend to disintegrate when boiled. The plants grow larger than average and produce large white flowers.

‘Whataroa’

The slightly elongated tubers are usually wider at one end, with most of the deeply set eyes concentrated towards the narrow end. The skin colour is pink, mottled with yellow. The flesh is yellow and when boiled the tubers remain reasonably firm. The petals of the flowers are white with light purple margins, and the main stems of the plant are red. Small tubers develop in the leaf axils on the stems in autumn when the subterranean tubers are developing.

‘Peruperu’

This cultivar is very commonly grown in Northland. The slightly elongated tubers are a creamy-yellow splashed with purple while the flesh colour is creamy-white, sometimes with yellow streaks. The potatoes tend to become floury when cooked. Flowers are a mid-blue.

‘Karupārerā’

Another cultivar common in the North, this is also known as ‘Kanohi Pārerā’. Both names mean ‘the eye of the duck’ (pārerā is the grey duck). The eyes of the purple tubers are usually surrounded by yellow, giving rise to its names. The flesh of the tubers is white and they tend towards becoming floury when boiled.

‘Huakaroro’

This potato has a yellow skin which is often splashed with pink and usually covered in numerous small brown dots. It is sometimes called ‘White Māori’. It has a very knobbly, slightly elongated shape and the eyes are set very deep. It yields more heavily than most of the other Māori cultivars, and the tubers are often very large. When boiled, the hard waxy tubers, which have yellow flesh, remain firm. It is a favourite for ‘boil ups’ (that is, potatoes boiled with pork bones or other meats and puha or watercress).

‘Kowiniwini’

The tubers of ‘Kowiniwini’ are very distinctive. The medium deep-set eyes are surrounded by bright yellow while the basic colour of the tubers is a deep purplish-red. The plants in the collection produced a much lower yield than other cultivars (see ‘Yields of Māori potatoes’ earlier in this paper) probably because the plants appeared to be virus-infected. The flesh of the tubers is creamy-white and they tend to disintegrate when boiled. This cultivar is also known as ‘Kaupari’.

‘Uwhi’

Also known as ‘Uwhihero’, this is another cultivar commonly grown in the north. It produces good yields compared to most other Māori cultivars. The pink to orange-pink tubers have moderately deep eyes with white flesh. The waxy tubers have a pleasantly distinctive taste when cooked. Like ‘Whataroa’, the plant produces small tubers in the leaf axils in autumn. The flowers are a mid-blue.

‘Māori’

With their shallow eyes and uniformly round shape, the tubers of this potato are quite different in appearance to most of the other Māori potatoes and it is possible that this cultivar is a more ‘modern’ type. The skin of the tubers is red with a rough texture. When they are boiled, the potatoes become floury even after they have been stored for several months. The plants have mid-blue flowers and produce a good yield of tubers.



Parareka



Rokeroke



Māori



Whanako



Peruperu



Huakaroro



Urenika



Whataroa

Fig. 9 *Māori potato cultivars*



Karupoti



Kowiniwini



Māori Chief



Raupi



Pāwhero



Ngā Oti Oti



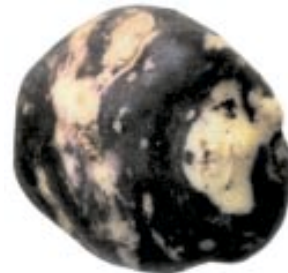
Moemoe



Uwhi



Poīwa



Karupārera

Fig. 10 *Māori potato cultivars*

‘Ngā Oti Oti’

Sometimes called ‘Ngā Outi Outi’, this potato has yellow and pink mottled tubers with deep-set eyes. It has white flesh which sometimes has red flecks outside the vascular ring. The potato is not suitable for boiling as the tubers very quickly disintegrate. The plant produces a relatively small haulm, and has very small dark green leaves and light blue flowers.

‘Poiwa’

This cultivar has features that are very similar to ‘Ngā Oti Oti’, the main difference being that the tubers have white flesh and are more waxy, remaining relatively firm when boiled.

‘Pāwhero’

Also called ‘Old Red’, this potato produces long red tubers which tend to be rather narrow at one end. They have relatively few, shallow eyes and are often mistaken for a kūmara. They have white flesh which sometimes has red flecks in the centre of the tuber. The plant grows vigorously, and has red stems and cream flowers with grey-brown striations on the inner parts of the petals. The flowers have very large prominent anthers. The potatoes remain reasonably firm when boiled.

‘Māori Chief’

Sometimes known as ‘Rangatira’, this potato has oval shaped yellow tubers which are splashed with red, and it has shallow eyes. It is said to be the same as, or similar to, ‘Northern Star’, a relatively modern cultivar that was released in the United Kingdom in 1902, and was described by Salaman (1987:169) as being a variety of little merit. The flesh of the tubers is white with purple flecks. Being a floury type, it is not suitable for boiling.

'Raupi'

The tubers of this cultivar have a yellow skin, often with purple blotches or splashes. The eyes are deep-set and the flesh colour is yellow, often with purple dots around the vascular ring. When boiled the tubers remain relatively firm. The plants have dark blue flowers and small crinkled leaves.

'Parareka'

This cultivar produces small elongated tubers with shallow eyes. They have pink skin with yellow markings. The flesh colour is white, and they have a floury texture.

'Whanako'

With its smooth skin, shallow eyes and regular round shape, this cultivar appears to be a more modern type. It has white flesh and remains firm when boiled.

'Rokeroke'

This potato has tubers that are similar in appearance to 'Whanako'. It also has white, waxy flesh.

'Urenika'

By far the most widely planted of the Māori potatoes, this cultivar is grown by Māori communities all over New Zealand. It is a potato that will persist in the ground for long periods without being cultivated, and is sometimes found growing 'wild' on old Māori occupation sites and on the sites of abandoned gardens. It is also known as 'Tuarua Waikato', 'Keretewha', 'Rongo Blue' and 'Tutaekuri'.



Fig. 11 'Urenika' plants growing wild near Turangi

With its elongated tubers with dark purple skin and flesh (see Fig. 5) which sometimes has white flecks, 'Urenika' is quite different to the other Māori potatoes and was described by Thomson (1988:182) as a cultivar 'that shows what are probably ancestral characters of the potato.' The tubers look similar in appearance to types grown by indigenous people in the Andes of Peru (See Fig. 1), and it was possibly introduced directly to New Zealand from South America by early sailors and traders who often provisioned their ships at South American ports. The plants have purple stems, and small tubers are produced in the leaf axils in the late autumn. Tubers are produced at the ends of long stolons and the flowers are white with grey striations in the centre of the petals. The tubers have a very floury flesh, and they will almost totally disintegrate if they are boiled when newly dug. The dark purple colour of the flesh is retained in cooking.



Fig. 12 A flower and leaf of 'Urenika'

Genet (1996: pers. comm.) considered that 'Urenika' is possibly synonymous with 'Congo' a United Kingdom cultivar introduced 'pre-1900' (P. Haddon 1999: pers. comm.). 'Congo' plants grown by the author showed identical morphological features to plants of 'Urenika' (grown from tubers collected from a range of locations within New Zealand) suggesting that 'Congo' and 'Urenika' have a common stock. However 'Congo' tubers were consistently larger than those produced by 'Urenika' plants. In Australia a cultivar known as 'Purple Congo' is popular with the Italian communities, where it is used to make *gnocchi*, a type of 'potato pasta'. Yen (1961/62:5) noted that 'Urenika' resembles the storied (iodine) potato of Ireland, used as a talisman against illness.



Fig. 13 'Congo' tubers are larger than those of 'Urenika'



Fig. 14 'Purple Congo' tubers for sale in a market in Melbourne

Summary and conclusion

The potato is of South American origin, from the Andes region that extends from Peru to Colombia, where it has been cultivated for over 2000 years. While its natural habitat is in the region of the equator, it is found at high altitudes where the temperature range and humidity are moderate.

The potato introduced to Europe and the United Kingdom in the late sixteenth century was a *Solanum tuberosum* subsp. *andigena* type, and being a 'short-day' plant because of its origins near the equator, its reaction to growing in the long day conditions of the European summer was to set tubers late in autumn as days became shorter.

By the time the potato was introduced to New Zealand in the late eighteenth century, it had become adapted to long day conditions, and a number of named cultivars had been developed which were classified as *Solanum tuberosum* subsp. *tuberosum*. These potatoes still retained many of the features of the *andigena* subspecies, such as irregular shaped knobbly tubers with very deep-set eyes and long stolons — and they still tended to set tubers fairly late in the season. Potatoes at this stage had a very narrow genetic base, having been developed from a very limited number of types introduced from South America two centuries earlier.

Several introductions to New Zealand were recorded as being made between 1769 and 1773. While de Surville is often credited with being the first to introduce potatoes to New Zealand, journals of his expedition record that while he introduced wheat, rice and peas, potatoes are not mentioned. Potatoes given to a Māori chief at Mercury Bay by Captain James Cook in 1769 are thought by some scholars to have possibly been the first successful introduction, but the evidence is not conclusive. Further introductions of potatoes were made by Marion du Fresne's expedition in 1772 and by James Cook's second expedition in 1773. While there is considerable debate about the early European introductions of potatoes it seems likely from the available records that at least one successful introduction was made between 1769 and 1773. During the late eighteenth century there were opportunities for considerably more introductions of potatoes from a variety of locations.

While it is generally accepted that potatoes were introduced to New Zealand by Europeans, some Māori maintain that they were first brought by their ancestors along with the kūmara. However, there is no scientific evidence that this was so. Other factors that suggest this was unlikely include the profound effect that European-introduced potatoes had on Māori society, the absence of any

documentation by early botanists recording the existence of potatoes, and the fact that the other plants introduced by Māori were from the warm humid tropics whereas the potato was adapted to a much more temperate climate and most unlikely to have grown successfully in tropical Polynesia. It is more likely that Māori developed some of their own cultivars by selection from seedlings of European-introduced varieties.

The effects of the introduction of potatoes on Māori society was dramatic. They were easier to grow than the kūmara, could be grown over a greater range of conditions and yielded a much greater return for the effort expended in their production. Several authors have stated that the methods of propagation and production of the potato were similar to that of the kūmara and hence it was able to fit into the agricultural system of the Māori with little modification. However, the two crops require different soil conditions, and while a number of kūmara crops could be produced from the same piece of cultivated land, for potato production new land was used at least every second year. Māori developed some innovative cultivation methods for potato production which were not used by European growers for the production of early crops.

By the early nineteenth century, Māori had extensive areas of land in potato production — much of which was grown for trade. Māori-grown potatoes and other crops played an important part in feeding the European populations of the major cities in New Zealand and a significant proportion of the crop was exported to Sydney. Māori production of potatoes peaked in the late 1850s and then declined rapidly following the land wars, although several scholars have suggested that the land wars only gave the final death blow to an already waning industry.

Many of the old potato varieties are still grown by Māori today — especially in the rural communities. With their deep-set eyes, irregular shape, long stolons and often colourful tubers, and their tendency to tuberise in the autumn, most of these 'Māori potatoes' exhibit the characteristics of the potato cultivars that were developed in the United Kingdom and Europe in the late eighteenth century. It appears likely that some of these cultivars have been grown by Māori whānau and passed on through many generations. They have been referred to as a *taonga* or something precious that has been passed on by their *tipuna* (ancestors) and this, in spite of the fact that they produced a much lower yield than 'modern' potatoes, provides some justification for their continued production. In addition, many Māori claim that the old varieties have a better taste than modern types. This claim is likely to have some justification, as a wide range of cultivars with differing culinary characteristics are still being grown.

Māori potatoes appear to have some commercial value, and occasionally they can be found for sale at roadside stalls and at weekend markets where they are sold at a considerable premium above that paid for 'modern' potatoes. However, because their yields are generally low it is unlikely that their production would be commercially viable.

Māori conferred numerous generic and varietal names on potatoes. In the north, potatoes were generally known as *riwai* or *peruperu* whereas they were called *māhētau* by the Ngai Tahu people of the South Island. On the east coast of the North Island, *parareka* was the most common generic name, while *taewa* was used from Taranaki to the Cook Strait region. Numerous varietal names were given to the potato and the same potato was often given different varietal names. Some of these names were descriptive while others were names of traditional root crops which were then transferred to varieties of the potato as people saw similarities among them.

During the acquisition of a collection of Māori potato cultivars as part of this study, it became apparent that the cultivar 'Urenika' is the most widely and commonly grown, followed by 'Huakaroro', 'Moemoe' and 'Peruperu'. Some cultivars, such as 'Māori Chief' and 'Māori', with their regular round shapes, shallow eyes and higher yields, appear to be more modern types, and as such probably should not be categorised as 'Māori potatoes'.

The Māori potatoes, most of which appear to be relicts of relatively undeveloped types introduced from United Kingdom and Europe in the late eighteenth and early nineteenth centuries, represent an important part of New Zealand's history. It is encouraging to find that they are still perpetuated by both Māori and Pākehā throughout the country, and that there is wide general interest in these plants.

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Appendices

- A. Characteristics of Māori potato cultivars.
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- B. Three of the common potato cultivars grown in Ireland at the mid 19th century. Photographs reproduced courtesy of The Agriculture and Food Development Authority, Dublin, Ireland
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Appendix A — Characteristics of Māori potato cultivars

Cultivar	Synonyms	Skin colour	flesh colour	eye depth	flowers	texture*	Tuber shape
Moemoe	Mui Mui, Ngā Toko	yellow/red mottled	yellow	deep	light blue	waxy	slightly elongated
Karupoti	-	dark red	white/purple centre	medium	large white	floury	round/oval
Whataroa	-	yellow/pink mottled	yellow	deep	white/purple	waxy	slightly elongated
Peruperu	-	creamy yellow with purple splashes	creamy white yellow streaks	deep	mid-blue	floury	slightly elongated
Karupārera	Kanohi Pārera	purple with yellow around eyes	white	deep	mid-blue	floury	round
Māori Chief	Rangatira, Parihaka	yellow, red splashed	white purple flecks	shallow	(seldom flowers)	floury	oval
Raupī	-	yellow with purple splashes	yellow	deep	dark blue	waxy	round
Parareka	-	pink/yellow mottled	white	shallow	very large white	floury	oval
Whanako	-	brown, pink tinge	white	shallow	no flowers observed	waxy	oval
Rokeroke	-	pink, yellow blotches	white	shallow	mid-blue	waxy	oval
Kowiniwini	Kaupari	purple/red with yellow eyes - distinctive	creamy white	medium	mid-blue (seldom flowers)	floury	oval
Uwhi	Uwhiwhero	orange-pink	white	medium	lilac with white centre stripe	waxy	oval
Māori	-	red russeted	white	shallow	mid-blue	floury	round
Ngā Oti Oti	Ngā Outi Outi	yellow/pink mottled	white, red flecks	deep	light blue	floury	round
Poiwa	-	yellow/pink mottled	white, red flecks	deep	light blue	waxy	round
Pāwhero	Old Red	red	white, red flecks	shallow	cream, grey stripes	waxy	elongated
Huakaroro	Karoro, White Māori	Yellow, with pink blotches	yellow	deep	lilac with white tips on petals	waxy	round knobbly
Urenika	Tuarua Waikato, Keretewha, Rongo Blue, Tutakuri.	Purple	Purple, sometimes with white blotches	medium	white, grey stripes	very floury	very elongated

* Tubers tested had been in storage for 90 days after harvesting.

Appendix B



'Lumper'



'The Cup'



'The Block'

Three of the common potato cultivars grown in Ireland at the time of the famine in the mid-nineteenth century. Photographs reproduced courtesy of the Agriculture and Food Development Authority, Dublin, Ireland.

Maori potatoes

IT IS a coincidence that in August 1997, when *The Garden* published a feature on South American potatoes, by George Mackay, pp 562-565, an article appeared in the *New Zealand Gardener* on Maori potatoes.

The introduction of potatoes to New Zealand is generally attributed to the French explorer de Surville in 1769 and to James Cook during his second expedition to New Zealand in 1773. These were followed by further introductions from a variety of sources.

The Maori believe that some of their potatoes pre-date the European introductions, and there is anecdotal, but not scientific evidence, to support this. Potatoes were soon a staple item in the diet of the Maori and replaced other traditional food sources. They also became an a trading commodity. Cultivars were selected and named, passing down

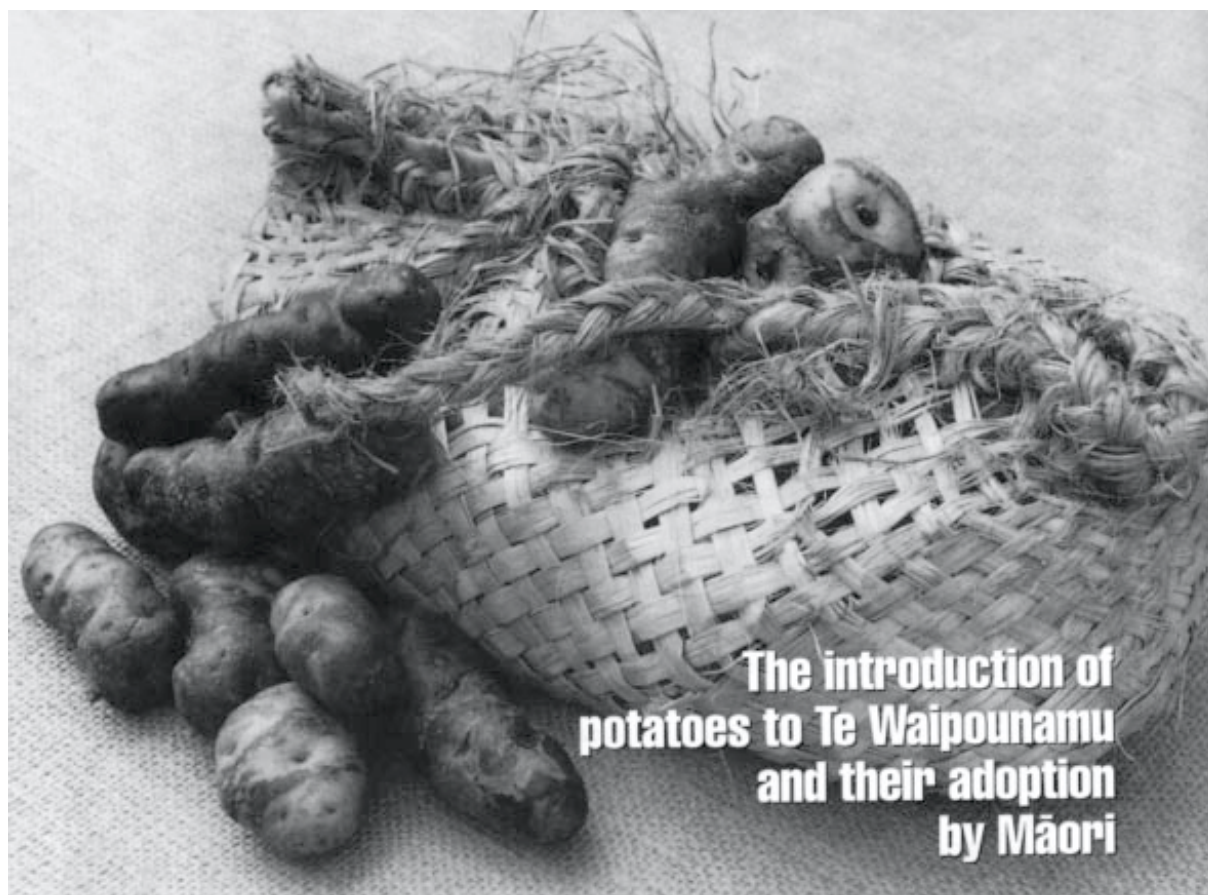
through families for many generations. Many are still grown today – some are *Solanum tuberosum* var. *andigena* types, with deep eyes that set tubers when days are becoming shorter. In many cases the connection between the original European variety names has been lost. The names of the potatoes in the picture clockwise from top, are 'Urenika', which is widely grown and some think might be synonymous with the early European cultivar; 'Congo', 'Peruperu', and 'Kowiniwini', which was also known as 'Karuparera', which means the eye of the duck, 'Karoro' and 'Uwhiwhero' (centre). Graham Harris, a lecturer in the Natural Resources Centre at The Open Polytechnic of New Zealand has set up a collection of 18 varieties of Maori potatoes. In co-operation with the Scottish Crop Research Institute in Scotland, he aims to compare them



Graham Harris

with European varieties of the 18th and 19th centuries.

DNA 'fingerprinting' will be used to establish possible matches which will give clues as to whether the New Zealand cultivars are derived from European sources, or whether they came direct from Peru. See *The Garden*, pp790-792 for an explanation of the method.



Mahetau

Potatoes were first reported to have been introduced into New Zealand by the French explorer de Surville in 1769. However, it appears that the first successful introduction may have been those planted in the Bay of Islands by members of Marion du Fresne's expedition in 1772. The first recorded planting of potatoes in the South Island where those made by the crew of the *Adventure* captained by Furneaux, the ship that accompanied Cook during his second expedition to New Zealand in 1773. It is recorded that they made several plantings of potatoes (brought from the Cape of Good Hope) at Queen Charlotte Sound and also at Dusky Sound in Fiordland. Following these early introductions many more were introduced by sealers, whalers and colonists.

Māori were quick to recognise the advantages of the introduced potatoes over the kumara. They were easier to grow, yielded more heavily and were easier to store. Because the method of propagation and production of the potato was similar to that of the kumara, it was able to fit into the existing agricultural system of the Māori with little modification. Potatoes were particularly welcome in the southern regions of the South Island where kumara would not grow. Records show that the early potatoes grown by Māori in Otago and Southland, were grown on mounds according to traditional kumara culture, and it is suggested they were introduced to the south by Ngāi Tahu from the Kaikōura region who were known to raise kumara. It seems that Cook's earlier plantings at Dusky Sound were not

successful, as European explorers who visited the area in 1893 could find no evidence of European plants.

Potatoes soon became the staple item in the diet of the Māori and also became an important trade commodity, not only within the Māori communities, but also with European colonists and for provisioning European ships. By the early 1800s, Māori were growing large crops of potatoes and an area of 50 hectares in potato production was not uncommon at the time.

In *Historical Records of New Zealand South*, the Sydney Gazette, September 1813 records the visit that year of Williams – a flax dresser, to the Bluff who noted:

The natives attend to cultivation of the potato with as much diligence and care as I have ever seen. A field of considerably more than 100 acres presented one well cultivated bed, filled with rising crops of various age, some of which were ready for digging, while others had been newly planted. Dried fish and potatoes form their chief support.

By the 1840s, Māori agricultural production, based mainly on potatoes and wheat, was thriving in Otago and Southland and several Māori groups were operating their own sailing vessels to transport their crops. Murihiku potatoes were regarded as being of particularly good quality and were in demand in the population centres further to the North.

The Chatham Islands also became an important region for potato production. When the Taranaki tribes, Ngāti Tama and Ngāti Mutunga sailed on the ship *Rodney* to colonise the Chathams in 1835, 78 tonnes of seed potatoes were included in their provisions. During the 1850s and 1860s they were producing “hundreds of tons” – much of which were exported to Australia.

Further evidence of the adoption of the potato by Māori was in the conferring of generic and varietal names. In the South Island they were generally known as *Mahetau* – (like a string of fishing sinkers), while in the North Island they were referred as *Riwai* or *Taewa*. In Muriwhenua another general name for potatoes was *Peruperu*, although this name is now used for a specific variety. *Peruperu* means – the white feathers at the throat of the Tui, although some believe it may refer to Peru – the country of origin of the potato.

Individual varieties were also named. Some with European cultivar (cultivated variety) names were given Māori names, for example the English variety ‘Derwent’, which was popular in the South island, became ‘Katote’ and ‘Old Red’ became ‘Pawhero’. Some, like ‘Early Rose’ and ‘Skerry Blue’ – an early Irish variety – retained their original names. Some varieties became known by different names in different areas, for example, the commonly grown ‘Urenika’ is also called ‘Keretewha’, ‘Tuarua’, ‘Waikato’ and ‘Ringaringakatira’. Many of the names are descriptive, for example, ‘Karupararera’, a variety which has a chocolate brown skin and yellow eyes – means ‘the eye of the duck’. Other common grown varieties include ‘Moemoe’, ‘Poiwa’, ‘Nga Outi Outi’ and ‘Raupi’. Some variety names that appear to be specific to the South Island include ‘Kopara’, ‘Papaka’, ‘Kariparoa’ and ‘Waitaha’. In many cases, the connection between the original European variety names and the given Māori names has been lost.

Some of the early potato introductions appear to be *Solanum tuberosum* var. *andigena* types which are characterised by very deep set eyes compared to the modern *S. tuberosum* var. *tuberosum* cultivars which have smooth skins. Varieties such as ‘Urenika’ which have been



Māori who are growing the old varieties claim that they have a better taste than modern varieties and there is some evidence to suggest they are more disease resistant than modern types.



... sixteen varieties of Māori potatoes are being grown in the Wairarapa and in Whangarei.

described as 'undeveloped' types, tend to set tubers late in the season when days are becoming shorter.

Many of the original varieties which were selected and perpetuated by Māori, are still grown today, even though modern varieties produce a significantly greater yield. Some have been passed down through families for many generations. Māori who are growing the old varieties claim that they have a better taste than modern varieties and there is some evidence to suggest they are more disease resistant than modern types. 'Urenika' appears to be the most widely grown variety – it is grown by Māori people from Northland to the Bluff and on the Chatham Islands.

It is generally accepted that many of the so-called Māori potatoes were introduced to New Zealand via Britain and Europe. It is possible that others were selected and developed by Māori from seedlings raised from these introductions. It is, however, a widely held belief among Māori that they grew some varieties of potatoes before the arrival of Europeans and while there is some anecdotal evidence passed down in proverbs and oral history, this has not been scientifically proven. In *Song of Waitaha*, Brailsford records Māori as bringing the potato to Aotearoa with the kumara, taro, karaka and other introductions.

He refers to – 'the small black potato, the old one named peruperu, the little yellow and the big red potato called parete.' Other publications refer to the variety 'Tatairongo' that was said to have been grown by Māori in South Taranaki before the arrival of Europeans. Because of the existence of such a weight of anecdotal

evidence, the possibility must be seriously considered.

Some Māori believe that the widely grown 'Urenika' is of pre-European origin. This potato appears to be similar to a type grown in the Andes of Peru. The growth habit and appearance of the plant and the long purple tubers with purple flesh, set them apart from most of the others grown by Māori. 'Urenika' is sometimes found growing wild on uncultivated ground – possibly remaining from those grown in old Māori gardens. In Northland, it has been found growing in the vicinity of old Kāinga sites.

Some scientists believe that 'Urenika' could be synonymous with the early European variety 'Congo'. Another possibility is that it could have been brought directly from South America, as the port of Callao near Lima in Peru was one of the main provisioning ports for early whaling vessels. Other varieties that are grown by Māori today that some believe could be of pre-European origin are: 'Kowiniwini', 'Uwhiwhero', 'Peruperu' and 'Karoro'.

In cooperation with the *Scottish Crops Research Institute*, Open Polytechnic staff are undertaking a project to attempt to match some of the Māori potato varieties with 18th and early 19th century European varieties that are grown in the Scottish collections. As part of the project, a collection of 16 varieties of Māori potatoes are being grown in the Wairarapa and in Whangarei. The project will also compare acquisitions of the variety 'Urenika' collected from various parts of the country, as it appears to be a very variable type with some strains producing much larger tubers than others, while some produce better crops if the tubers are planted late in the season.

Matching of varieties will be done by DNA 'fingerprinting' after initial possible matches are made from historical records, anecdotal evidence and by comparing and matching botanical characteristics from descriptions published by UPOV (Union for the Protection of Plant Varieties). 'Urenika', 'Uwhi' and 'Kowiniwini' are three that are being tested initially. While this procedure won't necessarily provide evidence of pre-European potatoes, it may well provide some useful leads.

The writer, Graham Harris, is a lecturer in the Natural Resources Centre at the Open Polytechnic of New Zealand and is currently undertaking research on the history and origins of the Māori potato. He is being assisted by Sonny Niha from Whangarei. Graham's wife Lexie is Ngāi Tahu, Ngāi Tuahuriri (Te Karaka Issue 4).



TOP: Some Maori potatoes the author has collected and is growing in the Hutt Valley and the Wairarapa. They are photographed with a Kete riwai (potato kit).

CENTRE: 'Urenika' has purple flesh with white flecks.

ABOVE: Maori stored potatoes in pits in the ground. Layers of punga (*Cyathea dealbata*) fronds were placed amongst the tubers. They found that the spores from the fern helped keep the potatoes free of some pests and diseases. For kumera storage, wheki (*Dicksonia squarrosa*) was used. Nowadays potatoes are usually stored in baskets or bags, but punga fronds are still used to keep the tubers healthy.

Riwai - the Maori Potatoes

By Graham Harris

POTATOES were first reported to have been introduced to New Zealand by the French explorer de Surville in 1769. However it appears that the first successful introductions were made by Cook during his second expedition to New Zealand in 1773 where it was recorded that he made several plantings at Queen Charlotte Sound and also at Dusky Sound in Fiordland. Following these early introductions many more were introduced by sealers, whalers and colonists.

Maori were quick to recognise the advantages of the introduced potatoes over the kumara. They were easier to grow, especially in cooler areas, yielded more heavily and were easier to store. Because the method of propagation and production of the potato was similar to that of kumara it was able to fit into their existing agriculture system with little modification.

Potatoes soon became the staple item in the diet of the Maori and also became an important trade commodity not only within the Maori communities but also with European colonists and for provisioning European ships. By the early 1800s Maori were growing large crops of potatoes and an area of 50 hectares in potato production was not uncommon at the time.

Further evidence of the adoption of the potato by Maori was in the conferring of generic and varietal names. In the North, potatoes were referred to by Maori as Taewa

(foreigner) or Riwai, and in the South as Mahetau (like a string of fishing sinkers).

Individual varieties were also named, for example the English variety 'Derwent' became 'Katote', while some like 'Old Red' and 'Early Rose' retained their original names. Some varieties became known by different names in different areas, for example the commonly grown 'Urenika' is also called 'Keretewha', 'Tuarua', 'Waikato' and 'Ringaringakaitira'.

Some of the names are descriptive. For example 'Karupararera', a variety which has a chocolate brown skin and yellow eyes, means 'the eye of the duck'. Some other commonly grown varieties include 'Moemoe', 'Poiwa', 'Nga outi outi' and 'Raupi'.

In many cases, the connection between the original European variety names and the given Maori names has been lost.

Some of the early introductions appear to be *Solanum tuberosum* var. *andigena* types and are characterised by very deep set eyes compared to the modern *S. tuberosum* cultivars which have smooth skins. Varieties such as 'Urenika' which have been described as "undeveloped" types, tend to set tubers late in the season when days are becoming shorter.

Many of the original varieties which were selected, named and perpetuated by Maori are still grown today, even though modern varieties produce a significantly greater yield. Some have been

passed down through families for many generations.

Maori who are growing the old varieties suggest they are more disease resistant than modern types. 'Urenika' appears to be the most widely grown variety - it is grown by Maori people from Northland to the Bluff and on the Chatham Islands. It is interesting to note that when the Taranaki tribes Ngati Tama and Ngati Mutunga sailed on the ship Rodney to colonise the Chathams, 78 tonnes of seed potatoes were included in their provisions.

It is generally accepted that many of the so-called Maori potatoes were introduced to New Zealand via Britain and Europe. It is possible that others were selected and developed by Maori from seedlings raised from these introductions.

It is, however, a widely held belief among Maori that they grew some varieties of potatoes before the arrival of Europeans and while there is some anecdotal evidence passed down in proverbs and

in oral history, this had not been scientifically proved.

In *Song of Waitaha*, Brailsford records Maori as bringing the potato to Aotearoa with the kumara, taro, karaka and other introductions. He refers to "the small black potato, the old one named peruperu, the little yellow potato and the big red potato called parete."

Other publications refer to the variety 'Tatairongo' that was said to have been grown by Maori in South Taranaki before the arrival of Europeans.

Because of the existence of such a weight of anecdotal evidence, the possibility must be seriously considered.

Some Maori believe that the widely grown 'Urenika' is of pre-European origin. This potato appears to be similar to a type grown in the Andes of Peru. The growth habit and appearance of the plant, and the long purple tubers with purple flesh set them apart from most of the others grown by Maori. 'Urenika' is sometimes found growing

wild on uncultivated ground - possibly remaining from those grown in old Maori gardens. In Northland it has been found growing in the vicinity of old pa sites.

Some scientists believe that 'Urenika' could be synonymous with the early European variety 'Congo'. Another possibility is that it could have been brought directly from South America as the port of Callao near Lima in Peru was one of the main provisioning ports for early whaling vessels.

Other varieties that are grown by Maori today that they believe are likely to be of pre-European origin are 'Kowiniwini', 'Uwhiwhero', 'Peruperu' and 'Karoro'.

In co-operation with the Scottish Crops Research Institute, Open Polytechnic staff are undertaking a project to attempt to match some of the Maori potato varieties with 18th and 19th century European varieties that are grown in the Scottish collections. As part of the project, I am maintaining a collection of

13 varieties in plots in the Hutt Valley and in the Wairarapa, while Sonny Niha has a collection growing in Whangarei.

Matching of varieties will be done by DNA "fingerprinting" after initial possible matches are made from historical records, anecdotal evidence and by comparing and matching botanical characteristics from descriptions published by UPOV (Union for the Protection of Plant Varieties.) 'Urenika' and 'Kowiniwini' are two that are being tested initially.

While this procedure won't necessarily provide evidence of pre-European potatoes, it may well provide some useful leads. *

Graham Harris is a lecturer in the Natural Resources Centre at the Open Polytechnic of New Zealand. Graham is undertaking research on the history and origins of the Maori potato, assisted by Sonny Niha from Whangarei. This is an ethnobotanical study (the study of plants and people and the interactions between them).

Digging the real dirt on potatoes

They look odd but taste good. Graham Harris is studying Maori potatoes

WITH their colourful knobby tubers and deep-set eyes, Maori potatoes are often offered for sale at roadside stalls, markets, greengrocers and even dairies.

The introduction of potatoes to New Zealand is generally attributed to the French explorer de Surville who planted some at Doubtless Bay in 1769 — about 200 years after they were taken to Europe from the Andes in Peru. Further introductions were made by Marion du Fresne's expedition in 1772.

The following year the crew of the *Adventure*, the ship that accompanied Cook during his second expedition to New Zealand, made several plantings of potatoes (brought from the Cape of Good Hope) at Queen Charlotte Sound. Many more were introduced by sealers, whalers and colonists.

Maoris were quick to recognise the advantages of the introduced potatoes over the kumara. They were easier to grow, yielded more heavily and were easier to store. Propagation and production of the potato was similar to that of kumara so it fitted into the Maoris' agriculture system with little modification and was particularly welcomed in the south of the South Island where kumaras would not grow.

Potatoes soon became a staple in the Maori diet and an important trade commodity not only among Maori communities but also with colonists and for provisioning European ships.

By the early 1800s, Maoris were growing large crops of potatoes and an area of 50 hectares in potato production was not uncommon. By the middle of the century Maori farmers were producing such large tonnages that several groups were operating their own sailing vessels to take crops to main population centres and a significant quantity was regularly sent to the Australian gold fields.

In the South Island, Maoris referred to potatoes as *mahetau* (like a string of fishing sinkers), while in the North they were called *riwai*, or *taewa*. Individual varieties were also named and some with English variety names were given Maori names, for example, *Derwent*, which was popular in the South Island, became *Katote*, and *Old Red* became *Pawhero*. Early Rose and *Sherry Blue* retained their original names; yet others were known by different names in different areas, for example the common *Urenika* is also called *Keretewha*, *Tuarua*, *Waikato* and *Ringaringakaitira*.

Many names are descriptive, for example, *Karuparera*, which has a chocolate brown skin and yellow eyes, means "the eye of the duck".

Maori potatoes are generally typical of early potato types often with a knobby appearance and very deep set eyes, removed in modern potatoes by selective breeding.

Many of the old varieties selected,

named and perpetuated by Maoris are still grown, though modern varieties yield much better. Some have passed down families for many generations.

While it is generally accepted that many of the so-called Maori potatoes were introduced from Britain and Europe it is likely others were selected and developed by Maoris from seedlings of introduced varieties.

It is widely believed among Maoris that they grew potato varieties before Europeans came. There is some anecdotal evidence passed down in proverbs and oral history, but this is unproven.

The most widely grown Maori potato is *Urenika* — a variety similar to one grown in the Peruvian Andes. The plant's growth habit and appearance and long purple tubers set it apart from most of the others grown by Maoris. *Urenika* is sometimes found growing wild on uncultivated ground — possibly a remnant of old Maori gardens. In Northland it has been found growing in the vicinity of old pa sites.

It seems likely that this variety came directly from South America by early whalers as the port of Callao near Lima in Peru was one of the main provisioning ports for early whalers.

In cooperation with the Scottish Crop Research Institute, I am trying to match some of the Maori potatoes with 18th and early 19th century European varieties grown in British collections. I have collected several varieties of

Maori potatoes which must be grown each year to maintain the collection.

Matching varieties will be by DNA "fingerprinting" after initial possible matches are made from historical records and by matching botanical characteristics.

The usual varieties that are produced and sold in any numbers include *Urenika*, *Moe moe*, *Peruperu*, *Karoro*, *Parareka* and *Maori Chief*, but they are seldom sold as named varieties.

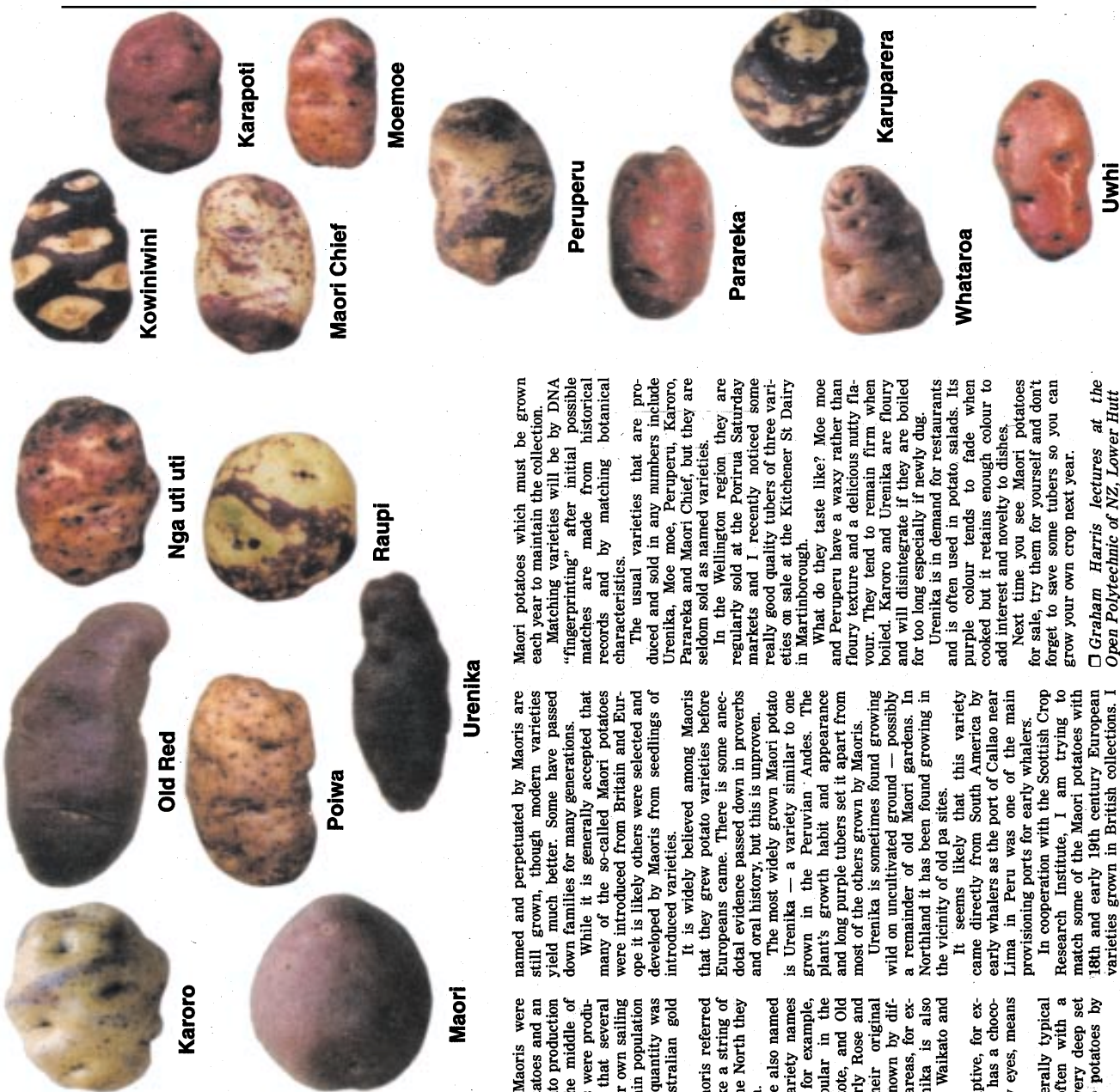
In the Wellington region they are regularly sold at the Porirua Saturday markets and I recently noticed some really good quality tubers of three varieties on sale at the Kitchener St Dairy in Martinborough.

What do they taste like? *Moe moe* and *Peruperu* have a waxy rather than floury texture and a delicious nutty flavour. They tend to remain firm when boiled. *Karoro* and *Urenika* are floury and will disintegrate if they are boiled for too long especially if newly dug.

Urenika is in demand for restaurants and is often used in potato salads. Its purple colour tends to fade when cooked but it retains enough colour to add interest and novelty to dishes.

Next time you see Maori potatoes for sale, try them for yourself and don't forget to save some tubers so you can grow your own crop next year.

□ *Graham Harris lectures at the Open Polytechnic of NZ, Lower Hutt Ph 04 566 6189*



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