

The foods of *Rongo-marae-roa*; sustaining the Māori of New Zealand

Nick Roskrige, Institute of Natural Resources, Massey University,

Private Bag 11222, Palmerston North, New Zealand

N.Roskrige@massey.ac.nz

New Zealand lies to the southwest extreme of the Pacific Ocean. Māori, as the indigenous Polynesian people of New Zealand, relied upon just a handful of cultivated crops to support their subsistence lifestyle and the tutelage of *Rongo-marae-roa* as their deity aligned to cultivated foods. The *kūmara* (sweetpotato) and *taewa* (Māori potato) are among a suite of crop introductions that arrived either with the first Polynesians or later colonial contacts.

The ability of Māori to transpose sub-tropical crops to a temperate climate corroborates their horticultural skill. Kūmara are a marginal crop as they need summer heat to produce quality roots and do not flower in New Zealand. However, Māori taught themselves to propagate kūmara from cuttings taken from selected over-wintered parent material. Kūmara became the staple carbohydrate food source and a valuable commodity, especially in cooler southern regions.

The introduction of potatoes in the eighteenth century impacted immensely on Māori. Without any pests or diseases of note, New Zealand provided a seemingly unlimited and suitable land resource; potatoes thus succeeded kūmara as the primary carbohydrate crop. However, modern cultivars of both crops and many pests and diseases have since been introduced to New Zealand, impacting greatly on these traditional crops.

With the growing interest in indigenous and holistic systems applied to crop management, the skills Māori applied to root crops are becoming increasingly scrutinised. A bio-technology approach to kūmara and taewa drawing from plant and soil systems is being investigated, inclusive of traditional practices, and will contribute to future production. Outcomes are expected to also contribute to the wider horticultural sector.

Keywords: New Zealand, Māori, kūmara, taewa, indigenous, South Pacific.

Introduction

New Zealand is an isolated country in the South Pacific with an often capricious climate and variable soil resource well suited to root and tuber crop production. Māori are the indigenous people of Aotearoa-New Zealand and as '*tangata whenua*' (literally 'the people of the land') they have created an enduring relationship with the landscape, including the flora and fauna which survives upon it. New Zealand is the southernmost landmass of the Pacific Ocean and of the Pacific cultures. As such it endures a relatively temperate climate with extremes from sub-tropical in the north to sub-Antarctic in the south. Coming from the tropical islands of the Pacific, Māori, on settling New Zealand had to adapt their horticultural practices to meet these climatic limitations. Much of their lifestyle was based on a subsistence approach including both cultivated and uncultivated plants and the seasonal harvesting of birds and fish. Among the plants which Māori had access to are two of the primary root and tuber crops, kūmara or sweetpotato (*Ipomoea batatas*) and taewa or Māori potato (*Solanum tuberosum* spp. andigena).

Māori root and tuber crop production systems

Kūmara is the noun in the Māori language for the root crop known as sweetpotato. Buck (1954) noted the name *kumar* exists in the Quechua dialect of Northern Peru for the sweetpotato and has probably contributed to the generic name *kūmara* used around Polynesia. Kūmara is the only South American plant in the inventory of plants grown by pre-European Māori. Early visitors to New Zealand identified sweetpotato (*kūmara*) as the most prominent crop being grown by Māori in northern districts (Yen, 1963; Best, 1976; Jones, 1989) and the staple

carbohydrate in the diet. Kūmara production was adapted by Māori to be grown in the temperate climate. There were several cultivars of pre-European kūmara of which only a handful survive and are grown today. The modern cultivars are sports of earlier sweetpotato varieties (mostly American varieties introduced through early European contact) which have gained favour with consumers and producers alike (Coleman, 1972; Yen, 1974).

In New Zealand both the pre and post-European cultivars of kūmara are not known to flower, and in fact, efforts to induce flowering have not been successful (Yen, 1963). An exception is the testimony of an early botanical observer who ONCE saw a kūmara plant in flower in the far northern region in 1883, (Hammond, 1894). This means that all varieties are propagated vegetatively. The kūmara plant is tolerant of salt winds, drought and lower fertility in soils, thus making it quite suitable to the sand and silt loams of much of the coastal fringe in New Zealand. It was not very successful however in most of the South Island of New Zealand because of the cooler climate but was grown in some coastal pockets where a warmer micro-climate existed. It was however, also considered a difficult crop to grow in the central North Island because of the severity of seasonal frosts and short growing seasons experienced there – except of course in some microclimates on river terraces with alluvial soils (Williams & Walton, 2003).

Traditional production of kūmara is immersed in customs expressed as ritual, prayers and incantations, and sacred behaviour because of the tapu or sacredness accorded to the crop. This sacred aspect falls under the tutelage of a cultural deity known as *Rongo-marae-roa* who holds responsibility for cultivated crops. Considerable effort was given to preparing land to benefit kūmara production such as draining swampy soils (Barber, 1984) or amending soils with gravels to raise temperatures and improve drainage. Early production systems were based on 'pieces' of kūmara with shoots being cut and planted rather than the process of shoot production which is the procedure used today (Berridge, 1913 & 1914; Yen, 1961; Best, 1976). Plants were placed in ridges or mounds and tended to religiously throughout the growing period, generally from November to the following March.

Harvest, grading and storage of the kūmara crop were equally important activities, also steeped in cultural practices. In the tropical Pacific, sweetpotato is continuously harvested on demand year-round and there is no need for specific storage techniques. The temperate and seasonal climate of New Zealand required Māori to adapt their management of the crop to ensure it was accessible throughout the year. Yen (1961) noted that in no kūmara growing region within New Zealand had he encountered over-wintering of kūmara in the field or in propagating beds of previous seasons. This observation was supported by over-wintering trials at several sites around New Zealand where the kūmara failed to survive the winter season. Crops that were late harvested or left in-situ over the winter months generally succumbed to rot pathogens; even when harvested they failed to store well after being held in a damp soil environment which had affected the skin and tuber qualities.

The taewa or Māori potato is a tuber crop known by a number of generic names according to tribe and dialect around New Zealand and as the 'native potato' or '*la papa nativas*' in its centre of origin. The term taewa differentiates the Māori potato from the more recently introduced 'European' potato (*S. tuberosum* spp. *tuberosum*).

There are several different beliefs regarding the origin of the Māori potato in New Zealand and the route taken to get there. It is generally accepted that potatoes were not brought as cargo during the migrations of Māori to New Zealand but how they arrived remains an interesting point. Some believe that chance visits by unrecorded trading vessels which may have earlier visited South America are responsible for the introduction of taewa (Richards, 1993). Other tribes hold beliefs that taewa were sourced by their own people from the bush or through other obscure processes. South Taranaki tribes in the North Island of New Zealand claim a variety known to them as Tātairongo was obtained from the underworld by their ancestor Te Reke Tātairongo (Hammond, 1924).

Captain James Cook is credited with the earliest recorded introduction of potatoes to New Zealand. On his first voyage and contact in November 1769 he visited Mercury Bay in the Coromandel region of the North Island. A man, Te Horeta Te Taniwha was a child at the time and his recollections in old age included:

'Cook then gave two handfuls of potatoes to the old chief [Toiawa], a gift of profound importance to the M oris. By tradition these potatoes were planted at Hunua where, after cultivation for 3 years, a feast was held and a general distribution made.' (Begg & Begg, 1969:36)

Lieutenant King, Governor of Norfolk Island is known to be a catalyst in the introduction of many exotic flora and fauna to the northern districts during a visit to New Zealand in 1793. King is credited with the introduction of the European or 'white' potato known to Māori as *riwai* which is said to have had an *'immediate influence on the food producing and dietary habits of the Māori's associated with these travellers'*. (Shawcross, 1967:142)

The Māori potato ultimately displaced traditional crops such as kūmara and fernroot (*Pteris* spp.) as the primary carbohydrate and subsistence crop produced by Māori for their own use (Best, 1976; Roskrüge, 1999) some calling it the:

'... greatest gift of the European to the M ori agriculturist... which by 1835 was much more in use than any native vegetable' (Hargreaves, 1963:103).

In comparison to many of the other crops grown by Māori, taewa had a high labour requirement which was able to be met by Māori communities at the time and yielded a plentiful return for the labour input (Firth, 1972). The potato production system copied that applied to the production of kūmara which Māori were very adept at and thus they became experts in production in a very short time. Local variations in cultivation such as the planting of crops by some inland tribes in light scrub as early as June (mid-winter) to shelter young growth from frosts (*ibid*) or site selection criteria on north facing slopes were common.

Contemporary systems and and biotechnology

Today taewa are produced using much of the same processes and technology as the modern commercial potato crops. Kūmara are also produced commercially but under an entirely contemporary system in just one region of the country which draws significantly from the international systems applied to this crop. During the early colonisation period these root and tuber crops were important to Māori economic development and provided a marketable product which sold readily and was in continuous demand both in New Zealand and Australia. This intensification of horticultural demand contributed to the large areas brought into production during the rapid colonisation of the nineteenth century and the growing importance of these crops (Roskrüge, 2007). Since colonisation however there has been a considerable change in the available land resource and biological pressures around these crops; new pest and disease pathogens, weed infestations and considerable postharvest management demands.

With the growing interest in indigenous and holistic systems applied to crop management, the skills Māori applied to root and tuber crops are becoming increasingly scrutinised. A bio-technology approach to kūmara and taewa drawing from both plant and soil systems is being investigated, inclusive of traditional practices, and will contribute to future production. Outcomes are expected to also contribute to the wider horticultural sector and include such things as rotation practices and the use of bio-fumigants in the soil to minimise fungal diseases through to the timely application of natural products such as plant extracts to assist in management of pests and diseases.

Taewa production systems are applied to approximately twenty taewa varieties with attributes ranging from yellow flesh & skin through variations of red, cream, blue and purple skin and flesh of several shapes and size. The retention of taewa in non-commercial systems has created considerable interest by the commercial sector. Future management will need to consider the preservation of the cultural factors contributing to their survival. Current production systems for these crops can include cultural aspects such as soil manipulation through biochar addition and crop rotation or plant physiological factors applied as harvest criteria. The restoration of this crop has included the need to define some primary agronomic factors such as timing and precocity of tuber-set by variety or nutritional demands aligned to the growth stages of the crops as well as submission of plant material to a seed certification programme thus eliminating generations of virus infection. Research associated with the agronomy of taewa continues but will take several more years to achieve commercial application due to the annual nature of the crop. Ultimately these factors help to better prepare producers for commercial demands: in the interim they will provide learning tools, some of them unique, for crop manipulation that producers of root and tuber crops can apply.

Conclusion

Sweetpotato and native potatoes; kūmara and taewa respectively, are the primary root and tuber crops form part of the food production systems of Māori in New Zealand. Both crops have a considerable indigenous knowledge base applied to them under the tutelage of a local deity *Rongo-marae-roa*. The modern pressures on these crops, not least the introduction of new pathogens and weeds has prompted the interest in some of the indigenous system tools applied by Māori and how elements of these systems such as key rotation practices could be applied in a contemporary horticultural context. It is expected these elements will assist producers in managing their crops and provide some unique learning tools of use to root and tuber producers in general.

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