

TRANSMITTING MĀTAURAKA MĀORI TECHNOLOGIES INTO HORTICULTURAL REALITY. GROWING KŪMARA IN TE WAIPOUNAMU, 2019.

Dr. Matiu Payne (Kāti Huikai, Chair, Te Rūnanga o Koukourarata)

Abstract

Kūmara (sweet potato *Ipomoea battatas*) and Kauru (a sweet food made from cooked Tī trunks (*Cordyline sp.*) were symbiotic in their cultivation and preparation practises. In 1870, Hone Taare Tikao explained in great detail preparation instructions for kauru and kūmara. Tikao's documented knowledge when complemented with pūrākau (legends) from Pōhatu pā (Flea Bay) and a waiata (traditional song) recounts kūmara cultivation technologies specific to Te Waipounamu (the South Island of New Zealand).

Keywords: Waipounamu, kūmara, kumara, Tikao, Manu, Tiria, pohatu, mahika, kai, kauru, wakawaka, Wohlers, Ruapuke.

Introduction

Mātauraka Māori (Māori knowledge systems) maintained by hapū and whānau of Kāi Tahu posit counterarguments to environmentally limited kūmara growth. Alternative and larger food supplies (such as Kauru) may have lessened local Māori dependence upon kūmara cultivation in Te Waipounamu, however it persisted.

From 1848, the Mahika kai cycle (of which kauru and kūmara were included) was irretrievably damaged through dishonoured land transactions between Kāi Tahu raketira (hereditary heads of whānau) and European land purchasing agents. Subsequent transactional impacts reduced kūmara and kauru cultivation as well as many other land-based resources that fed people, while maintaining social cohesion amongst the people. Newer cultivars and

species of starches such as Taewa (Māori potatoes) and other root crops gradually increased in favour in isolation of kūmara and kauru.

This paper discusses Mātauraka Māori technologies associated with kūmara, and presents findings from active kūmara plantations at various sites in the 2019/2020 growing season in Canterbury, New Zealand.

Mātauraka Māori technologies

Mātauraka Māori technologies are those techniques (conceptual and applied) and knowledge systems developed intergenerationally by Māori people (Payne, 2019). In respect to Mahika kai these technologies bring locally efficient food gathering and cultivation practices into operation. The kinds of technologies drawn upon by this paper incorporates written information from 1870 by Kāi Tahu tohuka, Teone (Hone) Taare Tikao, and pūrākau (legends) concerning a Kāi Tūhaitara (Kāi Tahu) ancestor known as Tūtakahikura and his methods of kūmara cultivation at Pōhatu pā. A final technology relied upon in this paper is a waiata (traditional song) recounted by an early German missionary to Ruapuke Island, Johannes Wohlers, in 1874, which is still sung today (Wohlers, 1874, p. 38).

Jim Williams, a Kāi Tahu academic, drew upon portions of Tikao's work concerning the husbanding of consumables by Māori in pre-contact Te Waipounamu. Williams asserted that:

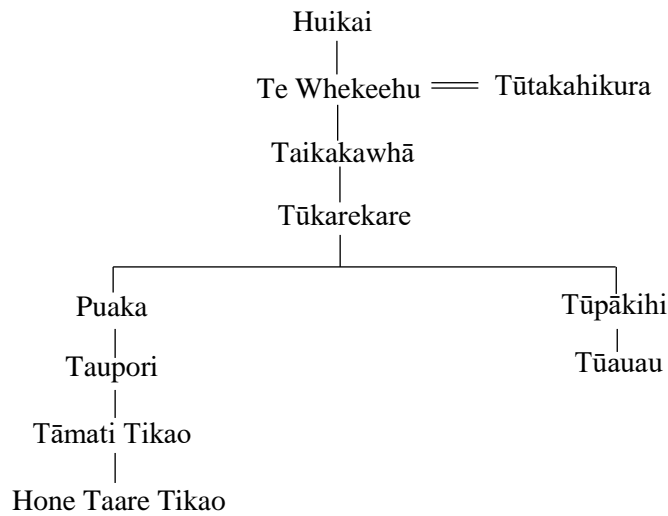
...These latter manuscripts are in the handwriting of Teone Taare Tikao (1850?-1927) and were forwarded by him to Elsdon Best, who lodged them in The Polynesian Society papers at the Alexander Turnbull Library (ATL). Of particular note is an annotation in the margin of the manuscript headed Mahinga Kauru that reads "cc d 12-4-70" with initials "F.E.N". Presumably, this recipient was Commissioner Francis E. Nairn. His initials, coupled with Tikao's handwriting, suggest that Tikao, then about 20 years old, may have acted as a scribe for the collection of some Canterbury

Kai Tahu Māori language material presented to the 1879-80 Royal Commission.

However, why this might have been made available to Nairn as early as 1870 is difficult to imagine (Williams, 2010, p. 150).

It appears then that Williams accredited Tikao's knowledge to others as he apportioned Tikao's chronological age at the time of its recording in 1870 as somehow being too young and merely a "scribe".

From a Eurocentric perspective of age, a person's maturity, learnedness, and the chronological age holds credibility, including within Western academia. However, from a Mātauraka Māori perspective of learning and formal tuition, youth began their tuition in traditional Whare Wānaka (schools of learning) from much earlier ages. From the age of 8 or 9, Tikao recounted that he was assigned by his father to learn traditional knowledge from two tohuka from within his hapū (Beattie, 1939, p. 6). Those tohuka were Koroko and Tuauau and were both closely related to Tikao's father Tamati (see Whakapapa 1). The Whare Wānaka associated with Tikao's instruction were located at Ōtohukaoraoteao, a coastal promontory between Kirikiriwaerea (Menzies Bay) and Ōtohukapae (Squally Bay). These schools of learning were reserved to akoako (pupils) of aristocratic lineage and keen intellect, both criteria that were satisfied by Tikao. Tikao by his own admission did not complete his learning from the two tohuka owing to their deaths by the time Tikao was a teenager. Surrounded by Kaumātua, his father and later missionaries, Tikao learned European knowledge, how to read and write and he quickly became a repository of customary knowledge (ibid). It is feasible then, that Tikao was in a position to write the manuscript from first-hand knowledge although it would have been likely that he would have enquired of his Kaumātua to confirm his opinions as written in a 1870 manuscript (Food-gathering customs of the South Island tribes, 1870).



Whakapapa 1: Whakapapa (genealogical) relationships between Hone Taare Tikao and the one of the Tohuka who taught him. Both descend from Tūtakahikura from whom the Pōhatu pā (Flea Bay) pūrākau are derived. *Source: Whakapapa records held by the author.*

Kūmara and Kauru Symbiosis

In Tikao's seven-page handwritten manuscript concerning the preparation of Kauru, he makes three innocuous statements in relation to the cultivation of kūmara and its interconnectedness with Mahika Kauru. Tikao's statements are:

[1]...Ka hoki katoa mai ki nga pa mahi ai i nga maara tou ai i nga kumara...

[they all returned to the villages and tended the gardens to set the kūmara beds]

(Payne, 2020)

[2]...Kia ngaro nga Kumara ka hoki ai ki te mahi ano i te kauru...

[when the kūmara were buried, they returned to preparing the kauru] (ibid)

[3]...ka tae hoki ki te whitu ka timata hoki te tou i nga maara kumara...

[when the month of November arrived, they would start to plant the kumara gardens]

(ibid).

These statements in the midst of seven pages of handwritten text concerning the preparation of Kauru, appear to be superfluous information if the focus was solely on Kauru production. However, from a kūmara focussed perspective the statements are valuable signposts.

Mahika Kauru

[1]...Ka hoki katoa mai ki nga pa mahi ai i nga maara tou ai i nga kumara...

[they all returned to the villages and tended the gardens to set the kūmara beds]

Kauru is a sugary substance made from the earth-oven cooked trunks and roots of the Tī (*Cordyline* sp.) tree. Mahika Kauru (the preparation of Kauru) involved whole whānau (extended family) and hapū (groups of whānau) groups in the labour necessary for its production. These same whānau and hapū would travel great distances to places known as Kaika Nohoaka (occupational food preparation sites) all around Te Waipounamu for the purposes of gathering different species of flora and fauna in large quantities. Food would be preserved, stored and transported back to the pā or villages where the main populations lived year round. The Mahika Kai network encompassed the whole of Te Waipounamu and was the pre-eminent economy in Te Waipounamu before the introduction of European monetary currency.

Kauru was cooked in abundance to ensure enough was prepared for one whole year's supply. As such, it necessitated many people to cut, trim, dig, cook, and store the necessary amounts. Mahika Kauru took many months to prepare and in Tikao's account, the work began in Ono (October). Whānau groups would travel great distances in September to their wakawaka (geographical boundaries) and Kaika Nohoaka to prepare the sites for their temporary accommodation and labour.

The Canterbury plains (Kā Pākihi Whakatekateka o Waitaha) were the richest source of Mahika Kai species in all Aotearoa/New Zealand prior to the land's mass conversion to pastoral farming from the 1850s. As such, Tī trees grew in abundance and supported mass

harvesting such as was involved with Mahika Kauru. Tī trees are also fast growing and could replenish themselves within five years of initial harvest. Rotational harvesting was employed by whānau and hapū to ensure the Tī's sustainability.

Having harvested the first round of Tī trees, they were stripped of their leaves, bundled and allowed to dry for 4 weeks. During this time is when Tikao says through the statement above that they all returned to the villages to set the kūmara beds. This would have been towards the end of October or thereabouts. Tikao notes that when the kūmara were buried (or disappeared) they returned to the duties associated with Mahika Kauru, which related to the cooking of the first batch which would now be dry and also the harvest of a second batch of tī trunks.

[2]...Kia ngaro nga Kumara ka hoki ai ki te mahi ano i te kauru...

[when the kūmara were buried, they returned to preparing the kauru]

In order to plant kūmara, a tāpapa kūmara (kūmara seed bed) must first be set. Tupu kūmara (shoots of the kūmara) sprout from the parent tubers after their burial in the tāpapa. It is those tubers that Tikao likely referred to as being “disappeared” as they are buried in order to encourage the tupu growth. It can take 4-6 weeks for tupu to grow when the temperature is warm enough. This process ties in accurately with Tikao's knowledge as outlined in the following statement.

[3]...ka tae hoki ki te whitu ka timata hoki te tou i nga maara kumara...

[when the month of November arrived, they would start to plant the kumara gardens]

When November arrived (after the tupu kūmara had sprouted) the people would return to the pā to plant the kūmara gardens. Once the kūmara gardens were planted they required very little care and the hapū returned to their kaika nohoaka to complete the second round of Kauru production, which would be completed in Iwa (January). Kūmara can take up to 6 months to grow from the time the tupu are planted.

In Tikao's account of tupu being planted in November, it would be expected that the first harvest would take place in February. Successive harvests arising from successive plantings, would occur in March and April. The timing of kūmara planting in Te Waipounamu is significantly different to kūmara plantations of the North Island where tupu can be planted out as early as August each year.

Tikao's three small statements in the context of seven pages of information on an obscure subject brings forth important information that supports the growth of kūmara in Te Waipounamu. His information is further supported through the content of a waiata collected in 1874 called *Manu Tiria*.

Manu Tiria – a traditional song

This waiata remained in text until 1999 when the words were resurrected by Tahu Pōtiki from Ōtākou and given to me when employed with a tribal project to revitalise waiata for tribal youth. Jodi Cameron, and Jasmin Dallas joined with me to recreate a traditional tune which is now sung throughout all important Kāi Tahu events.¹ It is a traditional Māori waiata sourced from recorded narratives associated with Māui (a Polynesian demi-god) was collected at Ruapuke Island in 1874 by Johannes Wohlers an early German missionary (Wohlers, 1974, p. 38).

This account speaks of Māui enquiring into his paternity. Māui's mother declined to tell Māui who his father was. He would therefore watch each night as his father would come to visit his mother. He noticed that his father appeared from beneath a poupou (carved pillar) in their sleeping house. Māui's parents would sleep together before Māui's father, known as Te Raka, returned to the underworld through his poupou portal before dawn. Māui, renowned for his curiosity, decided to change himself into a Kererū (a native wood pigeon)

¹ This waiata and its tune have been made public and can be accessed at <https://www.youtube.com/watch?v=NSstJybuqrY>

and fly after Te Raka through the Poupou portal to find out for himself, the identify of his father.

Wohler's narrative records that when Māui (now shaped as a Kererū) flew to the underworld he found a world of people who were in the process of preparing their māra kūmara (kūmara garden). When the people saw a big pigeon, they thought they would kill and eat it. Māui, to avoid an early death, flew towards his father Te Raka and then sat upon his kō (his digging implement). Through this action, Te Raka is said to have been made aware of Māui's identity as his son and was therefore not eaten that day. Through this engagement however, and as the waiata records, Māui learned that the correct time to plant the kūmara was the months of Whitu (November) and Waru (December). The waiata, through its verses then gives horticultural instructions to all who sing it. This waiata was collected in different versions amongst the communities of Murihiku (Southland) and Waitaha (Canterbury). As such, it would be incongruent that such knowledge was preserved without purpose.

The words of the waiata are:

Manu tiria, manu tiria	The bird who plants crops
Manu werohia ki te pohu o Te Raka	The bird who flew into the chest of Te Raka
Ka tau rerere	Who stayed there fleetingly
Ka tau mai i te ruhi	who became tired
e tau e koia	and rested there
Koia, koia ko tararauriki	Indeed it was here that we sourced Tararauriki
Ki mai Maui, e hara i te whitu me te waru e	Māui taught us to plant in the seventh and eight
e tau e koia, koia!	month, and so it is! (Payne, 2020)

This waiata supports Tikao's contention that kūmara planting occurred in the seventh and eighth month. It also lends support to the fact that kūmara must have been grown throughout all of Te Waipounamu as the source of this waiata was Ruapuke Island which is at New Zealand's extreme southern area. Therefore, with the planting timing ascertained it was left to seek Mātauraka Māori technologies that supported kūmara growth. For this information a traditional narrative associated with Pōhatu pā and a tipuna (ancestor) known as Tūtakahikura, provides guidance.

Pōhatu pā – a traditional narrative

Pōhatu pā is the traditional name of Flea Bay on Horomaka (Banks Peninsula). In Kāi Tūhaitara traditions, Pōhatu pā became the home of Tūtakahikura, his wives and whānau after the conquest of Horomaka in c.1620 by Kāi Tūhaitara. The pūrākau (oral legends), associated with Pōhatu pā record that the pā (village) got its name from the shingle that was used to warm the soils in the small bay to assist in the kūmara cultivation. Archaeological evidence in Pōhatu pā supports this pūrākau through extensive cultivations being recorded there (Furey, 2006, p. 90). Such technology was likely a localised development to deal with a southern facing harbour where cold southerly winds prevailed. The pūrākau suggests that smaller shingle (pōhatu and kirikiri) were placed on the kūmara mounds to attract and retain solar heat, which in turn warmed the soil and encouraged kūmara tuber growth. This is how a pā in Flea Bay became known as Pōhatu pā, the area's current Māori name.

Kūmara plantations 2019

In utilising Mātauraka Māori technologies, this paper sought to combine three sources of Mātauraka Māori (discussed above) and make practical application of this knowledge in the growth of kūmara in the 2019/2020 growing season. Four growing sites were identified, and these included:

- (1) Koukourarata (Port Levy) (36m²);

(2) The Biological Husbandry Unit (Lincoln University) (35m² and 150m²);

(3) Manaaki Whenua (Landcare Research, Lincoln) (12m²); and

(4) Te Pā o Rākaihautū (Special character school, Christchurch) (36m²).

Tāpapa kūmara (kūmara seedling beds) were planted at different times. The first tāpapa was planted on 8 July 2019 into transportable pots. Each containing a minimum of 4 kūmara tubers half buried. Two such tāpapa were stored in an office at Lincoln University where the constant temperature (via a heating system was 23 degrees centigrade). Large numbers of tupu kumara were produced from these tāpapa for planting in Koukourarata, the Biological Husbandry Unit (BHU) based at Lincoln University, and at Te Pā o Rākaihautū (Te Pā). Manaaki Whenua created their own tāpapa grown in greenhouses to produce tupu for their māra kūmara.

A successive planting system utilised at each site is represented in the table below:

#	Month	BHU	Te Pā	Manaaki Whenua	Koukourarata
1	1 September 2019				YES
2	1 October 2019	YES	YES		YES
3	1 November 2019	YES	YES	YES	YES
4	1 December 2019	YES	YES		YES

Plantation round #1 – September 2019 (projected February 2020 harvest)

This was an experiment and completely outside the bounds of Mātauraka Māori. A cloche tunnel was utilised to try and assist the tupu kūmara in the māra. Frosts, cold temperatures, and high winds in September killed all of the tupu planted this way.

Plantation round #2 – 1 October 2019 (projected March 2020 harvest)

A further experimental planting round occurred at Koukourarata, Te Pā, and the BHU. Some of the tupu survived however their growth was stunted and they did not grow with any vigour

owing to extremes of temperature and weather occurring in October 2019. Very few of the tupu planted produced tubers, and all were small.

Plantation round #3 and #4 – 1 November 2019, 1 December 2019 (projected April and May 2020 harvests)

All four sites (Koukourarata, BHU, Te Pā and Manaaki Whenua) were planted in this month and have experienced the best growth rate across all sites.

The BHU garden

The BHU garden consists of an outside māra that is 30m by 5m wide and a shade house that is 5m wide by 7m long. The external māra contained tupu kūmara planted in ara kūmara (mounded rows) and included different types of kūmara planted: Ōwairaka, Beauregard, Tokatoka, Reka Rawa, Māhina, Purple Dawn, and Hawaiian Blue. Male and Female kūmara were planted interchangeably however after a while, the male tupu kūmara proliferated and they were the majority of tupu grown. The external māra in this location was met with an influx of pests including pūkeko (swamp hens), rabbits/hares, and mice, who made meals not only of the tupu but also the tubers as they drew near to harvest.

An additional impact on this harvest was the imposition of Level 4 lockdown across New Zealand in response to the Covid-19 pandemic. The BHU premises was locked down and unable to be accessed from early March 2020 to mid-May 2020. This was the key time for harvesting kūmara and the rabbits and mice were able to feast for a longer period on the tubers in the external garden, whereas the tubers and plants inside the shade house were not as affected by rabbits and mice. Some minor frost burn had occurred by the time harvest began which did not overtly affect the harvest.

The kūmara inside the shade house (Ōwairaka and Beauregard) were planted in puke kūmara (individual kūmara mounds) and ara kūmara (long kūmara mounds). Utilisation of

the shade house was an artificial way of replicating the use of pōhatu in heat retention for kūmara growth.

The resulting weight of kūmara from the outside māra from all varieties was 24.796kg and from inside the shade house, 49.5kg.

Te Pā o Rākaihautū garden

Kūmara were planted in October, November and December in different māra blocks on the same site. Negative weather induced impacts also occurred for these māra. The additional burden for this māra, was premature harvesting by community members. Kūmara plants were harvested well ahead of when they were due to fruit by unknown community members who would sneak in to the māra after hours. This significantly impacted any kūmara from being harvested from this māra. It was clear from growth until that point that kūmara would have eventuated if left alone to grow.

Manaaki Whenua garden

The Manaaki Whenua (Landcare Research) māra was built and maintained by Katarina Tawiri, and Hana Walton, employees of Manaaki Whenua. Lincoln University students and other volunteers also participated in the creation of this māra.

The māra was a raised bed measuring 10m x 1.2m. The varieties of kūmara planted there included Ōwairaka, Tokatoka, Candy, and Beauregard. These tupu were planted out on 19 December 2020 and harvested on 1 May 2020 (232 growing days), following the deaths of the tupu planted one month earlier. The resulting kūmara tubers (of all varieties) weighed a total of 35.5kg.

Koukourarata Garden

The Koukourarata garden was situated in a garden that had been utilised for two previous seasons. These kumara faced the same climactic seasonal challenges as the other māra.

Despite producing tubers they did not grow to any great size. Purple dawn, Beauregard and

Ōwairaka were planted, yet only the Ōwairaka variety survived to produce tubers.

Approximately 7kg of kūmara were harvested from this plot.

The table below brings together the data of weights per māra for each variety of kūmara.

	BHU Outside Māra (150m ²)	BHU Inside Shadehouse Māra (35m ²)	Koukourararata Outside māra (36m ²)	Manaaki Whenua Outside māra (12m ²)	Totals (kg)
Owairaka Red	11.936	44.1	7		63.036
Beauregard	1.0	5.4			6.4
Purple Dawn	1.0				1.0
Hawaiian Blue	0.4				0.4
Tokatoka	2.6				2.6
Mahina	5.376				5.376
Reka Rawa	2.5				2.5
Totals (kg)	24.796	49.5	7	35.5	109.866

It appears from these results that the Ōwairaka Red variety of kūmara when grown in artificially heated circumstances, such as a shade house, produces greater weights of tubers.

This is consistent with the mātauraka Māori understanding of using shingle and sand to achieve the same outcome. While it grew better in heated conditions, the Owairaka red, along with other varieties also grew in outside māra with little interference from humans.

Comments

The Encyclopaedia of New Zealand: Te Ara, records the following statement concerning the growth of kūmara in Te Waipounamu:

The northern part of the South Island was about as far south as kūmara (sweet potato), the staple crop of Māori horticulture, could be grown. Archaeologists have interpreted features at the mouth of the Waiautoa (Clarence) River – the location of Matariki pā – as evidence of kūmara gardens. Further south, at Taumutu on Lake Ellesmere, are depressions that may be ‘borrow pits’, from which Māori gardeners took shingle to create warmer soils for growing kūmara. The introduction of the European potato,

which could be grown in colder climates, transformed the economy of the southern Ngāi Tahu (Tau, 2020, June 14).

These statements are founded in mono-cultural (Archaeologists) understandings of the natural world and are independent of Mātauraka Māori not only as a knowledge source, but also as an applied practice.

The 2019/2020 planting season has shown that kūmara do grow in the colder climate of Te Waipounamu within the realms of this understanding. An extension to this thinking needs to support applied practise outcomes for kūmara plantations further south than Waihora (Lake Ellesmere). This is essential in reactivating Mātauraka Māori in respect of the waiata Manu Tiria, as much as it is in Tikao's recollection that hapū from all over Te Waipounamu participated in cultivating kūmara as part of, and simultaneously with, Mahika Kauru. The physical technologies of utilising heat induced modalities (including gravel/shingle amongst soil) appear to be the means through which hapū grew kūmara. Only through the impacts of colonisation and the systematic destruction of mahika kai cycles has the growth of kūmara become less well known in the New Zealand consciousness.

The 2019/2020 growing season demonstrated the transmission of Mātauraka Māori technologies into horticultural reality, which will result in further kūmara growth in Te Waipounamu in accordance with Mātauraka Māori.

References

Books

Beattie, H. (1939). *Tikao Talks: Traditions and Tales told by Teone Taare Tikao to Herries Beattie*. A.H. and A.W. Reed, Wellington.

Manuscripts

Food-gathering customs of the South Island tribes (1870) MS-Papers-1187-208. Alexander Turnbull Library.

Journal Articles

Williams, J (2010). Mahika kai: The husbanding of consumables by Māori in precontact Te Waipounamu, *The Journal of the Polynesian Society*, 119(2), 149-180.

Wohlers, J (1874). The Mythology and Traditions of the Maori in New Zealand, *Transactions of the New Zealand Institute*, 7, 3-53.

Websites

Te Maire Tau, 'Ngāi Tahu - The move south', Te Ara - the Encyclopedia of New Zealand, <http://www.TeAra.govt.nz/en/ngai-tahu/page-2> (accessed 14 June 2020)

Manu Tiria: can be accessed at <https://www.youtube.com/watch?v=NSstJybuqrY>

Government Publications

Furey, Louise (2006). Māori Gardening. An archaeological perspective. *Science and Technical Publishing*. Department of Conservation, Wellington, NZ.