

Te Reka O Te Kai

Maara Kai Practical Guide



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Disclaimer: The information in this publication is a guide only and TWKO recommend that you consult your own Kaumatua for rohe specific tikanga.

Introduction to the Guide



*"Me whakātū maara hei āwhina ngā kaupapa o ā mātou marae... kia puta ai ngā kai...kia ora te iwi, te whānau, ngā mokopuna hoki."*¹

Tawhai McClutchie, Ngāti Uepohatu

Beginning a maara kai is a great way to support the aspirations of our communities and our marae. There are many benefits of producing your own food:

- The products you eat will be fresh, flavoursome, pesticide free and of an improved nutritional quality
- The amount of money your household spends on food will be reduced
- You can eat local food, grown in a safe environment, without food miles
- You can enjoy varieties of food not available in retail shops
- The garden is a good educational tool for family, friends and the community
- Gardening allows you to get exercise and enjoy fresh air and nature's company
- The health of our families and the future generations will be sustained.

This guide has been compiled by Te Waka Kai Ora to introduce whānau to methods for establishing their own maara kai. The history of traditional agriculture in Aotearoa is briefly described and the practical steps that are needed for growing your own food are explained, with particular emphasis on kai Māori.

The monthly calendar in this guide helps beginner gardeners by explaining step by step what to do in the garden from the Māori New Year in Pipiri (June-July), month by month. An explanation of the traditional māramataka or moon calendar is also included, highlighting activities for each night of a moon month.

Whilst the Māori New Year usually begins in Pipiri (June-July), any time of the year is good to start creating a maara kai for your whānau. It is important that when you do start a maara that you begin with tasks you can cope with time wise and physically.

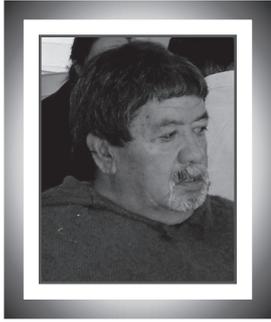
This guide is designed to provide basic information for beginner gardeners, however the best way to learn about how to grow in your region is to consult other gardens where you are from. Our kaumātua in particular are important in their role as the keepers of knowledge about maara kai.

Te Waka Kai Ora History

"Te Waka Kai Ora is a collective committed to promoting Hua Whenua, Hua Māori and Hua Kaiora as initiatives that promote the use of traditional Māori values and ethics of organic food production. Ecological and cultural sustainability are central to our mission. We are committed to responsible economic development in a manner that is consistent with our guiding principles:

- Mauri
- Rangatiratanga
- Oritetanga
- Wairua
- Tikanga
- Whānau
- Karakia
- Kaitiaki
- Mātauranga
- Tinana

Hua Parakore



"Hua Parakore is an integrity based process about authenticating Māori seed, Māori grown, Māori verified, Māori marketed and Māori exported. Hua Parakore is the Māori point of difference."

*Te Iwi Puihi Tipene (Percy Tipene), Ngati Hine, Te Waka Kai Ora Chairman
Puritia Ngā Tikanga a o Tātou Matua Tūpuna*

The term 'Hua Parakore' is used by Te Waka Kai Ora to describe the production of food that is pure and uncontaminated, similar to the term 'organic' that is used to describe foods that are produced using natural fertilisers and non-chemical means of pest control. ²

Who Can Participate?

We know that our Māori communities have a wide spectrum of needs and Hua Parakore has been developed to meet these needs.

- Whānau, kura and kohanga, and other whānau/hapu/iwi organisations wanting to grow healthy kai for themselves can join the Hua Parakore programme to access resources, self assessment tools and support
- Farmers and growers can sign up for the verification process so they can use the Hua Parakore tohu on their kai for the domestic market
- And our Māori investment businesses can add value to their export product through our indigenous and organic certification

The Hua Parakore kaupapa grows along the kūmara vine. Te Waka Kai Ora have Hua Parakore representatives and case study whenua throughout the motu. Get in touch so we can link you up. www.tewakakaiora.co.nz info@tewakakaiora.co.nz

Join the Hua Parakore kaupapa and tautoko our aspirations Tino Rangatiratanga o Nga Hua Māori!

What Does Our Tohu Represent?



The triangle depicts niho taniwha, the kaitiaki that protects what lies within. The centre koru pattern represents mauri. The supporting pattern on one side represents wairua, the other side kawa. Kawa maintains understanding and reverence of life. This maintains the wairua or spiritual essence which then protects life force or mauri. Connecting us to Papatūānuku through Hine-ahu-one, these together maintain our physical health now and in the future.

Traditional Agriculture in Aotearoa



When our Māori ancestors first arrived in Aotearoa from Polynesia they were unfamiliar with the common foods here, and the climate and environmental conditions in which they had to cultivate the crops they had brought with them. They had to make changes to the food they ate and the way they grew it if they were to survive in Aotearoa. Because the island was entirely within a temperate zone, hardly any of the Polynesian crops grew here. Only the kūmara or sweet potato was able to be successfully cultivated throughout Aotearoa. ³

Whilst Tāne is acknowledged as the atua or deity of the forest and many of the plants and animals who live there, Haumiatiketike and Rongomātāne are the atua of uncultivated and cultivated food respectively. The offspring of Haumiatiketike are the various fernroots that can be dug out and dried in the sun. Rongomātāne despises war and violence and thus hides in the earth and his offspring are the kūmara.

Traditional Māori agriculture is informed by the ethic of kaitiakitanga which prescribes that the spiritual and physical health of the environment and the people as of utmost importance. This health is understood in terms of the quality of mauri; the energy and life force of all things. Mauri is therefore a central concept for growers. All living things have mauri which is affected by external influences, the sun provides energy for external growth in the daylight and the moon provides energy for internal growth in darkness. People also have the ability to influence mauri and the Māori approach to cultivating and harvesting is one that ensures that the mauri of cultivations and the people is maintained and enhanced. ⁴

The following key values support our ability as kaitiaki and as growers to enhance mauri:

- Integrity and ethics in all aspects
- Commitment to caring for the environment and nourishing the land or whenua
- Cultivation of produce in a chemical free environment
- Empowerment and self sufficiency for all involved
- Economic well-being and quality of life
- Upholding tikanga Māori ⁵

Months of Matariki Used in this Publication

Names of the months in the māori language are the same for both calendar years e.g. Pipiri is known as a name for June in the Gregorian (Common) calendar while Pipiri normally straddles both June and July in the Matariki year depending on the moontimes. ⁶

This publication uses the Matariki Moon Months:

- | | |
|---|----------------------------------|
| 1. Pipiri (June-July) | 7. Hakihea (December-January) |
| 2. Hōngongoi (July-August) | 8. Kohi Tātea (January-February) |
| 3. Here-turi-kōkā (August-September) | 9. Hui Tanguru (February-March) |
| 4. Mahuru (September-October) | 10. Poutū-te-rangi (March-April) |
| 5. Whiringa-ā-nuku (October-November) | 11. Paenga-whāwhā (April-May) |
| 6. Whiringa-ā-rangi (November-December) | 12. Haratua (May-June) |

Maara Kai Practical Guide

The following practical guide provides the steps we can take in the garden to embody these values and enhance the mauri of our whenua and of our people.

Karakia

"Me tiro haere ki ngā āhuatanga o te pūtaiao hei arahi ia rā, ia rā."

Percy Tipene

Understanding what is happening in our gardens requires us to have a continuous relationship with the natural environment. The quote above was taken from a discussion with Te Waka Kai Ora champion Percy Tipene. He suggests that we should use our senses to observe changes and indicators within the natural environment. Percy gives an example of observing indicators; the practice of looking at the clouds in the morning and afternoon for redness to know whether it will rain or not in the following day. Through karakia, ritual or prayer, we are able to acknowledge and respond to the atua that support the change and growth of the natural environment, and of all things in our maara. ⁷

The practice of beginning and finishing every day with a karakia is part of the customary practice that has been handed down by our ancestors. Ritual interaction with the natural environment through karakia supports the growth of food that is healthy for the spirit, the soul and the body. ⁸

The following karakia is suitable for use at the beginning or end of the day. It is from the Ringatū faith.

Karakia, Hei Whakamoemiti Hei Whakawhetai

Nā te Hāhi Ringatū

He honore, he kororia, he maungarongo ki runga ki te whenua,
he whakaaro pai ki ngā tāngata katoa.

Kororia ki tōu Ingoa Tapu.

Hei mua koe i a mātou e Ihowa,

hei tohutohu i a mātou mahi katoa.

Ko koe anō hoki hei whakakaha i a mātou,

kia whai kororia ai mātou i roto i au mahi katoa.

He mea timata, he mea mahi,

he mea whakaoti i roto i a koe,

kia whiwhia ai mātou ki te orangatanga,

ki te mea e atawhaitia nei e mātou i tēnei ra.

Kororia tou Ingoa Tapu

Ake Ake Āmine. ⁹

Karakia

no Te Iwi Puihi Tipene (Ngāti Hine) ¹⁰

E konei ka puta nga ahuatanga mahi Rongoā, Kai,
nga tohu rangatira a nga Tohunga, e matakite,
nui ona Matauranga mo Tua-Atea
ko te whariki mo te timatatanga o nga kakano o nga mea katoa,
mai e te koputanga ki te whānau ngā mai ki tenei ao.
E Tangata matatau ki te mua, te muri, te mana, te ihi,
me te hohonutanga o nga mea katoa,
mai ia Io-Taketake; Io-Nui, Io-Roa, Io-Uru,
Io-Mata-Aho, Io-Wānanga, mai
I ēnei ahuatanga ara Karakia ka ahi te Tohunga,
ki te hou atu ki tenei Ao.

Whanaungatanga

Everything you do in your maara, is a good opportunity for whanaungatanga, or building relationships in your whānau. Gardening is an activity that is best done by a whānau or a group of people and requires cooperation. Working in the maara can be a good exercise for whānau to learn how to work together. It is also a good excuse to spend quality time together, sharing in your learning and rewards. In the time you spend in your garden you can catch up, discuss the current affairs of the day, enjoy the telling of histories and stories by your old people, learn traditional practices that are special to your whānau and learn waiata and karakia.

"For indigenous communities everywhere land is life. Those who have their culture and their identity and their language grow crops that are so much needed for the world, that is agrobiodiversity. Evidence and data from around the world show that we can live in a more sustainable world and have more sustainable systems if we also adopt a paradigm of more local foods and more local food systems."

No Phrang Roy

Composting

Plants take nutrients from the soils and atmosphere as they grow. As plants die and decompose, nutrients are returned to the soil. When we remove plants, we deprive the soil of these nutrients. If we continue removing plants without replenishing the soil, the end result is infertile soils and inferior crops.

Therefore the first practical step to take for maara kai is to create safe soil that isn't deficient in important minerals and that will give rise to healthy plants and healthy people. This can be achieved through composting which takes waste matter and transforms it into a living substance.

Following are a range of simple and more advanced methods of creating composts.

1. Basic compost to get microbial activity going in your garden:

Combine:

- A shovelful of compost from an existing heap
- Cow dung (1 part to 10 of water)
- Half a kilogram of fertile garden soil that has been added to one litre of water and left overnight
- Stinging nettle or comfrey that has been fermented in rain water

2. Compost stacking method from Kaiwhenua organics

Stack a layer of each of the following ingredient to the compost pile to a height of 1 -2metres:

- Mānuka brush
- Weeds
- Comfrey
- Hay
- Chicken/Horse manure

The compost pile will break down over a period of 6-8 months. Ensure that air is able to get through the pile to keep it aerated. Piles of compost can then be scattered all over the garden and dug into the soil. When the compost is ready it is dug into the garden.¹²

Natural Fertilisers

Sometimes soil may need to be supplemented by not only compost but also with fertiliser, particularly for plants with high requirements for a certain nutrient. The following table shows different fertilisers that can be used to supplement various nutrient deficiencies.¹³

Animal manures	These are an important fertiliser but must be free of chemicals such as drenches and antibiotics. The best manures to use are cows, poultry, sheep, pig and horses
Kitchen scraps	Use this with damp, screwed up paper or cardboard sprinkled with lime weekly for a worm farm
Weeds	E.g.; Ragwort, thistle, etc. This needs to be fermented in water
Grey water	Sink or bath water. This can be used to either grow compost materials or irrigate citrus, subtropical fruits or feijoas
Rock dust	Combine with plant matter and dung to make a fertiliser for mineral replacement. You must allow some time for microbes to work before using

Fish	This can be diluted and applied as needed to provide essential minerals
Comfrey	Growing comfrey can provide a useful animal feed and a fertiliser. It requires a deep soil; roots must be able to get down to 1.5 metres. It is ideally planted in spring about 60cm apart both ways so that they block out weed growth. Plant 6 – 8cm pieces of root or pieces of the crown. This can be mixed with manure and left for 3-4 weeks. Then every second or third day it needs to be stirred and can be dug into trenches for veges
Seaweed and comfrey	Fill a drum with a lid with seaweed and a few bundles of comfrey leaves. Cover with water, filling to the top, and keep covered until the liquid is a dark colour
Seaweed and kina	Combine seaweed, kina shells, kina juice and the insides of kina and fish bodies. This should be diluted before use
Dolomite	This gives seeds and seedlings a bit of a boost
Ash and charcoal	When clearing cultivations, brush and weeds by burning, the returning of ash and charcoal to the soil is a good fertiliser
Carbon crops	You should plant 60% of your garden over a year as carbon crops, e.g.; corn, jerusalem artichoke, grains, lupins, broadbeans. This will maintain nutrients in the soil

Seeds



*"Without seeds we haven't got a future.
Without kai we haven't got a future."*¹⁴

Geneva Hildreth, Does Geneva have an Iwi?

It is ideal to be able to raise your own plants from seeds or cuttings as much as possible. But germinating seeds requires just the right conditions. A seed raising mix can provide seeds the support they need:

Kaiwhenua Organics Seed Raising Mix

- 1/3 Worm castings
- 1/3 Compost
- 1/3 Sand

Before planting from seed the land needs to be cleared. Pigs can help with this as they willingly eat tubers from the earth and do a good job of digging over the soil. They also contribute to the fertility of the soil by adding manure.¹⁵

When sowing the seeds, it's important that they be sown in a mound of soil if it is winter to keep the seeds out of the wet. If it is summer, particularly when it is very dry, sow seed level to the ground. Then once they are bigger you may want to cover the soil over them so that they will retain moisture.



"Tino Rangatiratanga o te hua Kākano".

Jessica Hutchings, Ngāi Tahu, Ngāti Huirapa

At the end of the season when your crops are producing their own seed, you may wish to save some to plant next season. By knowing the whakapapa of your seeds, or where they have come from, your crops have integrity and are safe. If you are trying to save seeds for the first time try crops that are easier to save seeds from, e.g.; cabbages, cauliflower, broccoli, kale, lettuce, tomatoes and pumpkin. Choose seeds from crops that:

- Have stood up to the climate and the environment
- Have the best flavour
- Have resisted pests and diseases

It's important to keep your seeds in a dry environment and away from pests. ¹⁶

Pest Management

Once your crops are growing it is important that you manage any pests that may be in your garden. Pests are a crucial part of the ecology in your garden. So it's always important before deciding how to manage them to take the time to observe whether pests are just nibbling the plant or destroying it as many plants can outgrow minor damage. Pests may play an important role by providing food for birds or insects that pollinate your plants, or by preying on other pests. Weeds can be useful because they retrieve minerals from the subsoils and cover bare soils to protect them from erosion and leaching of nutrients.

Weeds are also useful as an indicator.

Weeds that indicate a fertile soil	Borage, chickweed, cleavers, dandelion, stinging nettle
Weeds that indicate an acid soil	Buttercup, horsetail, plantain, sorrel (also indicates a lack of calcium)
Weeds that indicate a damp soil	Buttercup, coltsfoot, comfrey, dock, horsetail
Weeds that indicate the amount of nitrogen	
Clover (soil lacks nitrogen), cow parsley (soil has too much nitrogen)	

Pests may also be prevented in the first instance by:

- Minimising stress. The less stressed plants are the greater their ability to resist pests and disease
- Sacrificing more stressed plants in order to maintain most of your healthy plants
- Making sure you don't overfeed plants as this makes them weaker
- Growing a diverse range of plants in your garden
- Intermixing plants making them less obvious targets
- Encouraging predators
- Using barriers and traps
- Using biological control
- Planting leafy crops close together to shade weeds out
- Hoe regularly

Companion Planting

Companion planting can also be used to reduce weeds in your garden. The following chart shows which plants like growing with others and what pests they repel.

Companion	Crops	What the Companion Repels
Basil	All garden crops	Flies, mosquitoes, tomato hornworm
Borage	Cucurbits, strawberries, tomatoes	Tomato worm
Brassica (cabbages etc)	Nasturtium, marigold, sage	Aphids, nematodes, white butterfly
Calendula	Tomatoes	Mosquitoes
Chives	Apples, berries, carrots, grapes, lettuce, peas, radishes, salsify	Aphids, bronze beetles
Corn	Tomatoes, mint, rosemary, soybeans	White butterfly, moths, bronze beetles
Cucumber	Beans, celery, lettuce, nasturtiums, potatoes (early crop only), savoy cabbage, sunflower	Cucumber beetles and other bugs
Garlic	Cabbage, roses, tomatoes, fruit trees	Deters many insects, a garlic tea helps repel late potato blight
Lavender		Moths
Leeks	Carrots, celery	Aphids
Onions	Carrots, celery	Aphids
Rosemary	Beans, cabbage, carrots, sage, cucumber and all curcubits, tomatoes	Bean beetles, cabbage moth, carrot fly, slugs and snails
Roses	Cabbage family, carrots, tomatoes	Bronze beetles, aphids, rose beetles
Thyme	All garden crops	Cabbage moth and root fly

Natural, Organic Treatments

Natural, organic treatments can also be used to safely reduce pest problems. The following chart shows various remedies, their preparation and application and what pest problems they can be used for.

Remedy	Preparation and Application	Pest Problem
Wormwood	Steep in hot water and apply to nests and ant trails	Ants, fleas, ticks
Nettles	Steep in hot water, cool and spray affected plant	Aphids, black fly, mildew
Garlic	Combine 4 crushed cloves of garlic and 6 whole chillies in a blender to a smooth paste. Then add a liter of hot water that has been made frothy with 2 tbsp of laundry powder (not detergent). Allow to cool and spray	Ants, cabbage worm, caterpillars, spiders, tomato worms
Pyrethrum	Steep flowers in hot water, allow to cool and spray on affected plant	Ants, aphids, earwigs, flies, green beetles, white butterfly
Fever few	Steep flowers, stems and leaves in hot water, allow to cool and spray affected plant	Aphids, green beetles, thrips, white fly

Onions	Blend onions to milky consistency in blender. Dilute resulting liquid by half with water. Strain and spray	Aphids or red spider on roses
Wire tunnels	Fashion from strips of chicken netting, place over peas and beans.	Birds
Mesh covers	Fashion from Chinese square wire mesh. Make them the same width as your beds and between 1/2 - 1 metre long. Direct sow your seeds, once seedlings past the stage that they'll be easily eaten or scratched out take the cover off	Birds
Eggshells	Crush them and sprinkle around the base of plants, or, make a tea by leaving 12 crushed eggshells in 1 liter of water overnight	Blossom end rot
Nails	Sow a few into the ground	Cutworms
Fresh milk	Spray on undiluted	Mildew on cucumber or pumpkin
Rhubarb	Steep leaves only in hot water, cool, add crushed chilli, grated sunlight soap and spray affected plant	Slugs, whitefly, white butterfly

Harvesting

Hui Tanguru and Poutū-te-rangi (February-April) are the most important months for harvesting, however in the right climate, and when growing a wide variety of crops it is possible to harvest from your garden almost all year round. Different plants can be harvested at different times and often external tohu or indicators are helpful in telling us when it is time to harvest. In some districts, the flowering of the rātā vine indicated that it was harvesting time. On the East Coast, when the star Poutū-te-rangi (Altair in Aquila) appeared, kūmara would be inspected and the storage pits would be prepared. In the Mataatua district, Whānui (Vega) indicated the beginning of harvest time. As always, it is best to ask those who are experienced growers in your areas about the tohu that they look to for help. Identifying these requires practised observation over several seasons.¹⁷

Pātaka

Once you have harvested your crops you can decide what you want to do with them. Some crops might be important for providing food for your household, other crops may be good for collecting seed and some may wish to sell their crop if they have enough. However one of the most enjoyable aspects of growing your own food, is the ability to use it as koha or gifts to exchange with others.¹⁸

If you wish to store crops for future sale or koha you should create a pātaka or a storehouse that is safe and dry. However you should only store food in your pātaka for a short period of time as the sooner it can be used the better. Try and ensure that you store food from Rongomātāne or cultivated food from your maara separate from food from Haumiatiketike or uncultivated food.¹⁹

Crop Rotation

Once harvesting the land of its first crop, you may want to consider carefully what to grow in the last crop's place. Crop rotation involves growing different perennial or annual crops on the same area.

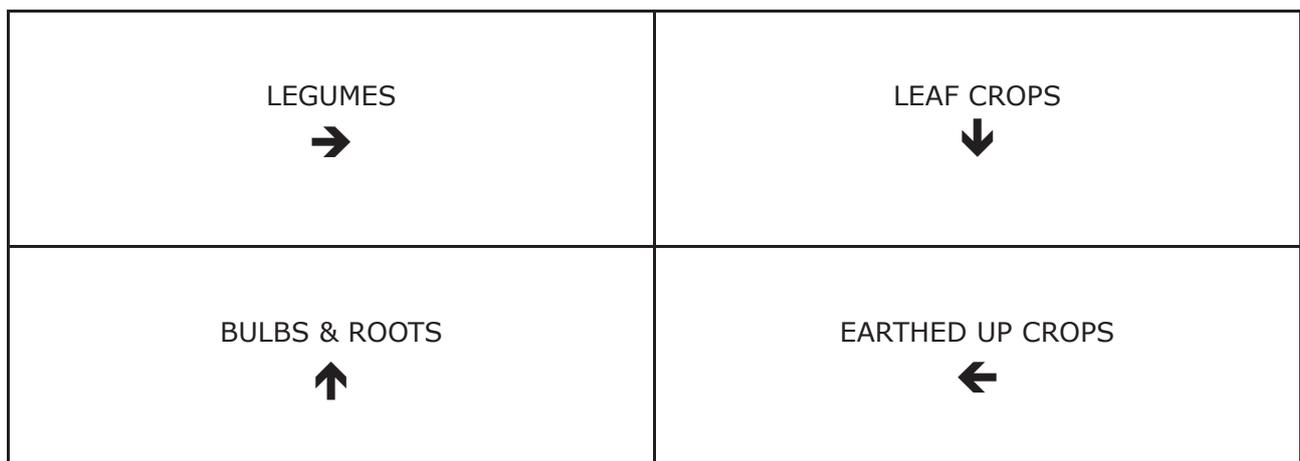
By regularly rotating the crops you grow on the areas of your maara you can:

- Reduce erosion
- Improve and maintain good physical, chemical and biological soil conditions
- Discourage weeds
- Eliminate the use of fertilisers
- Disrupt the build up of insect populations and disease life cycles
- Maximise the use of nutrients
- Encourage healthy root systems to retrieve nutrients from the soil, minimising leaching

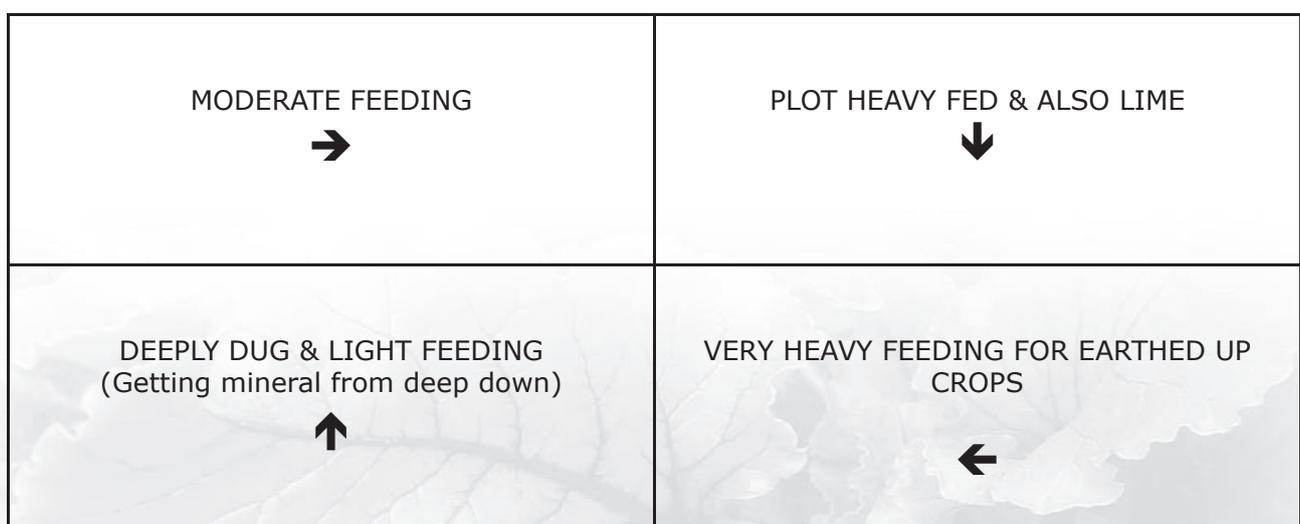
The following method is recommended for easy crop rotation. ²⁰

You should rotate your crops in the following order:

- Legumes (do you want to put examples here?)
- Leaf crops (do you want to put examples here?)
- Earthed up crops (potatoes, leeks, celery etc.)
- Bulbs and roots (carrot and garlic etc)



These crops should be accompanied by the following regime of fertiliser:



Any areas not used for growing crops can have a green manure crop such as lupin and mustard. These crops are cut and dug into the ground whilst still in a lush state and allowed to be broken down by the soil microbes and fungi.

Growing Māori Kai

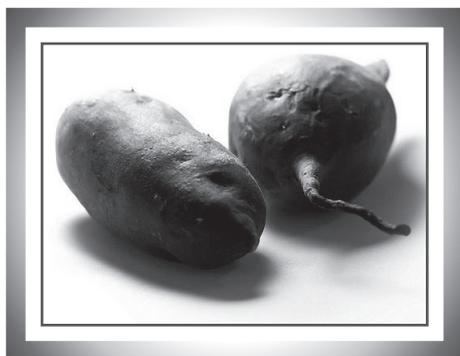
Ko Te Rongoā te Kai, ko Kai te Rongoā.

Rongoā Māori

As Māori, we recognise that eating the right foods ensures not only a health body but a healthy soul as well. In this respect, the plants we grow are an important part of the practice of rongoā Māori, or Māori medicine. Greens in particular such as pūhā, kopakopa and kawakawa are good for cleaning the blood and the body. You therefore may want to also think about including plants that provide important medicinal support for your whānau. Your kaumātua or healers in your area are best to ask about the use of specific plants for specific ailments, but it is always important to encourage and respect the general healing properties of the plants you grow and your maara system as whole.

There are some foods that are particularly valued by Māori and they have been carefully handed down to us from our ancestors. This section will briefly describe some of these foods and provide some information on them.

Kūmara



Kūmara are particularly special for Māori as we have an ancestral relationship to the crop that goes back for generations. Kūmara have important significance spiritually and culturally as they are used ceremoniously and in rituals. It is said that Whānui, a star who lived in the heavens had the original kūmara. When Rongonui heard of the kūmara he decided to visit his elder brother Whānui to ask him to let him have some to bring back to the earth. He took some seed with him and impregnated his wife Pani-tinikau with the kūmara. This was the beginning of the progeny of the kūmara on earth. However, ultimately kūmara are an important crop due to their nutritional value; they are an excellent source of vitamin A, vitamin C, fibre and potassium, and they have a delicious taste.

There are at least 27 different varieties of kūmara, but here are a few traditional varieties and their description. ²¹

Hutihuti	From Te Waipounamu, with white skin and flesh
Parapara	An old medicinal kūmara that was used to feed the elderly, the babies and the invalid
Paukena	An old variety from the East Coast which is orange coloured and very sweet to taste. A reliably good cropper. It contains more water than other kūmara. Can be used to make kūmara kao. Often referred to as a pumpkin
Poporo	This is dark purple right through and remains very dark after cooking. It is nutrient dense and tastes excellent; very sweet and dry
Rekamaroa	From the Wairau area of the South Island. They grow long rather than fat, but are a good size to eat and have creamy coloured skin and flesh with a good flavour, medium texture, not too soft or too dry

Rekarawa	A large white skinned variety from the far north. Has the taste of roast chestnuts
Romanawa	This has a gold skin, yellow flesh but with orange mandalas within the flesh when cut in half. It is very sweet and of a medium texture, not too dry or too soft
Taputini	An ancient cultivar that does not really run. It produces large numbers of long white kūmara

Kūmara grow well in alluvial plains with rich sand-loam top-soil. They are best bedded in Hōngongoi and Here-turi-kōkā (July-September) and they shouldn't be planted on wet days when the dirt has been saturated with water; it is not good for planting seeds. Kūmara are best sown facing the east with karakia done prior to planting. They are grown to produce sprouting roots ready for selection. The best plants are those of around 25-35cm height with 8 or more leaves. To reduce the possibility of pests and disease, they should be cut above the ground, not pulled from the soil.

They can then be transplanted into the growing fields over the months of Whiringa-ā-nuku and Whiringa-ā-rangi (October-December). Plant kūmara 500 mm apart in small mounds. Keep stacking soil on top of the kūmara as it grows. Train the kūmara so that they don't spread all over your garden by cutting the tails and tying them. Bracken can also be placed underneath the tails to stop them from striking. They should get watered 3 or 4 times over a week or so to help establish them. It is also good to throw dry sand over them, as the air makes them go rotten. Saw dust also works well.

The harvesting of kūmara takes place in Hui Tanguru and Poutū-te-rangi (February-April). They can be ploughed over, found and cleaned by hand, leaving them to dry on top of the ground. Kūmara are best stored in wooden bins over the winter, spring and early summer months, in a temperature and humidity controlled environment which helps prevent weight loss, sprouting and pithiness. During this important storage period, kūmara undergo a naturally occurring curing process, converting starch to sugar. This also allows the kūmara to heal themselves from any cuts, bruises and skinned areas caused during harvesting. ²²

Taewa, Riwai ²³



Taewa, riwai or 'Māori potatoes' are some of the most deeply treasured Māori foods available to us today. Ironically they are not native to Aotearoa or even Polynesia but instead originate from South America. There are 18 varieties, with information about many of these being held only by the few that grow them. However beginner growers should try and grow some of the more accessible varieties.

All potatoes prefer cool, moist soils and will not grow on the same soils year after year. Try and rotate your potato crop at least every second year. Māori potatoes are grown using very similar methods to those used for kūmara, in mounds.

Once you harvest your taewa, if you are going to save them, you should leave them out in the air to dry off first, to harden off to ensure they store well, making sure to get all the ones with bites or nicks out so that they don't contaminate each other and rot.

Sugar sacks are good for storing them in, however when they start sprouting they'll go through the sugar bag and you tend to damage them too much trying to get them out. Covering them with fern leaf is a good way of keeping them dry as the fern spores keep them healthy. Mamaku is a good fern for this. Plastic crates are also good to hold them in as they are easy to handle. It is important for Māori potatoes that your pātaka has good free air flow and is dry, cool and dark.

One of the varieties is called 'uwhi' which may be referring to the Polynesian yam which was brought to Aotearoa from Hawaiki. These grow in similar conditions to kūmara but they have a longer growing season, requiring several more months of nurturing. They are harvested at the first frost.

The table below shows the 18 different varieties of Māori potatoes and how to distinguish them.

Cultivar	Skin Colour	Flesh Colour	Eyes	Flowers	Texture	Tuber Shape
Moemoe	yellow/red mottled	yellow	deep	light blue	waxy	slightly elongated
Karupoti	dark red	white/				
purple	medium	large white	floury	round/oval		
Whataroa	yellow/pink mottled	yellow	deep	white/purple	waxy	slightly elongated
Peruperu	creamy yellow with purple splashes	white yellow streaks	deep	mid-blue	floury	round
Karupārera	purple with yellow eyes	white	deep	mid-blue	floury	round
Māori Chief	yellow, red splashed	white purple flecks	shallow	(seldom flowers)	floury	oval
Raupī	yellow with purple	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	waxy	oval
Rokeroke	pink, yellow blotches	white	shallow	mid-blue	waxy	oval
Kowiniwini	purple/red with yellow eyes	creamy white	medium	mid-blue (seldom flowers)	floury	oval
Uwhi	orange-pink	white	medium	lilac with white centre stripe	waxy	oval
Māori	red russeted	white	shallow	mid-blue	floury	round
Ngā Oti Oti	yellow/pink mottled	white red flecks	deep	light blue	floury	round
Poiwa	yellow/pink mottled	white, red flecks	deep	light blue	waxy	round
Pāwhero	red	white, red flecks	shallow	creamy, grey stripes	waxy	elongated
Huakaroro	yellow, with pink blotches	yellow	deep	lilac with white tips on petals	waxy	round knobbly
Urenika	purple	purple	medium	white, grey stripes	floury	elongated

Taro

Taro is also an important variety brought from Polynesia. It is said that it was left here by Kupe for his daughters on the Wairarapa Coast. These crop are best planted in Mahuru (September-October) in wet, boggy, light filtered soil. There are different methods for growing taro; small offset roots could be pinched off and propagated, or the stem could be removed from the corm and placed into the soil. They are an excellent starchy vegetable and a natural steroid.

Kānga



Kānga or corn, can be planted in Whiringa-ā-nuku to Hakihea (October-January). Sow seeds at a depth that is approximately three times the diameter of the seed, with 20 – 30cm space between them. Pick them when the silky threads on the cobs turn brown or black. Part the top of the leaves and test ripeness by pressing a grain with your fingernail. If it is milky it is ready. ²⁴

Pūhā

Pūhā is a green vegetable native to Aotearoa. It can be found growing wild. The 'smooth' leaved pūhā is the most popular. The slightly bitter and 'prickly' leaved pūhā is also eaten. They are a good source of iron, fibre, folate and vitamin A and C. It grows all year round. ²⁵



Matariki Maramataka

The Matariki Maramataka is a system of understanding and living with the natural world. A cultured system of working passed to us by our Tūpuna applicable to this day. ²⁶

The Matariki or Pleiades Constellation is cluster of many stars whose appearance just before dawn on the northeastern horizon towards the end of Haratua (May) signals the completion of one year and the approach of another in the Matariki Māori Calendar. For some tribes Puanga (Rigel) a star in the constellation of Orion rising to the east of Matariki holds this position. ²⁶

This is a good time to go walking and look for the signs of the star cluster Matariki. If Matariki is seen twinkling brightly, it is a sign that the year will be a good one for growing food, the fruits and vegetables will be large and plentiful, but perhaps dry in the summer. Puanga is particularly important for those in Whanganui and Taranaki as it is difficult to view Matariki in the West Coast of the North Island.

The Matariki System of Time, Seasons and Industry, commences with Hinamarama, the new moon following the heliacal (dawn) rising of Matariki (Pleiades). The length of the Matariki year is determined by the number of complete lunar cycles between rising of Matariki from one year to the next. A lunar cycle consists of 30 moon-nights, or 29.5 days. ²⁶

Before the new moon in Pipiri (June-July), at the of the Matariki Year, a karakia can be done to close off the work that has been done. Some prepare whare Maire for reflection, to discuss goals and aspirations and plan for the year to come.

Māori Fishing and Cultivation of food are primarily influenced by the gravitational pull of the moon and its effect on the natural world about us, the phase of the moon, presence of Food-Bearers and other Signs of the Season. ²⁶

Food-Bearers are specific planets or stars of the heavens seen just before dawn. They are tapu and known as harbingers, the carriers of seed, weather predictions and signs to commence kōanga or hauhakenga, planting or harvesting crops. Signs of the Season are the appearance of specific birds, insects and native trees or plants in flower or fruit. ²⁶

The fruiting of the miro tree is also marked by the appearance of Puanga. The observance of the Matariki New Year period may also be marked by the running of the piharau or lamprey.

Kia Tika te Marama me Hakato e ngā Maara

Monthly moon calendars, or maramataka, are more specific than seasonal or monthly calendars in that they specify the actual days on which certain food related activities are or are not advised. Generally the maramataka dictates that seedlings that grow above the ground should be planted from the new moon to the first quarter and seedlings of root crops that grow in the ground should be planted from the full moon to the third quarter. There are similarities as well as differences between tribal and geographical areas. However, as with all knowledge about growing it is recommended that you ask the growers in your area, particularly kaumātua about maramataka specific to your area.

Practical Gardening Guide

The following calendar describes what is happening every month of the year and provides information and guidance on what to focus on in your maara. ²⁷

Hōtoke Winter

Pipiri (June–July)

"Matariki ahunga nui."

"Matariki provider of plentiful food."

The Matariki New Year is a joyful time for remembering those who have passed and coming together with whānau to feast in celebration of the New Year. The rest of Pipiri (June-July) is left to wānanga, discuss and plan out the work for the year in the garden. An assessment of the crops planted and stored can be done and crops can be rotated. It is a good time for transplanting shrubs or trees. As the cold months endure, native trees go into state of hibernation which is ideal for transplantation. Being damp it is also the right conditions for newly planted trees to accustom themselves before the growing time in spring. It is also an important time for resting.

Hōngongoi (July–August)

"Tātutu kaikore, tamaahu kai nui."

"Perform the rituals when there is no food and do the same when there is plentiful." ²⁸

This is still a time for rituals to be conducted to ensure that the year will progress well; karakia, wānanga, reflection, discussion and planning for your maara. Everything is inactive because of the frost and snow so it is the ideal time to get together inside with the whānau to do this.

However there are still plenty of things you can do outside in your maara. It is a good time to plough, put down manure and compost. You can also plant garlic, riwai, strawberries and cabbage. You can sow broad beans into trays at the new moon and transplant them when their tops appear. It is also a really good time to prune or tie down any fruit trees you have to stop growth of the branches that grow quickly and straight up into the sky, producing little fruit. Spray or rub off any lichen from trees now while the trees are dormant. Have a break on the full moon.

Here-turi-kōkā (August–September)

"Toitū te marae o Tāne, Toitū te marae o Tangaroa, Toitū te iwi."

"If the marae of Tāne survives, likewise the marae of Tangaroa, and the people will live on."

Getting your maara well prepared for the new season is important for a successful maara which will feed your whānau. Finish your kūmara beds and get going on preparing your seed beds. If you start sowing seeds this month get in a good range of flowers and herbs right from the start so that you avoid pest problems later. Also remember that it is good to plant more than one seed together so that if one doesn't survive there will be another one. If you are intending to produce your own fertiliser, take the time now to make a stand on which you can fit several large barrels for fertiliser.

Kōanga Spring

Mahuru (September–October)

"He kaihua ki uta, he toka hapuku ki te moana."

"A birding tree on land, a proper rock in the sea." 29

With the right assets a whānau will be well fed. Having the right things in place can provide plenty of food for your whānau. Now that warmth has arrived to the land, this is the perfect time to get a new garden into full swing. It's important that you have everything in place that will support it. It's a good time for a tidy up in general, to check your water supply is ample and to get composting. It is a particularly important time to compost any fruit trees or an orchard if you have one.

Once everything is in place, get your seeds and seedlings taken care of. Plant any more of the seed you have for this season. You can sow the following into trays: rocket, mizuna, cilantro, mesclun, broccoli, tomatoes, peppers, melons, courgettes and cucumber seed. Sow buttercup, eggplant, dwarf beans, cleome, marigold, sweet hyssop, nasturtium, sweet pea, lettuce, parsley in the first quarter of the moon. Seedlings planted into trays will need pricking out and to be placed in direct full sunlight.

Whiringa-ā-nuku (October–November)

"E ngaki ana a mua, e tōtō mai ana a muri."

"First clear of the weeds, then plant. (If the first group do their work properly, those following can accomplish their task and everyone gets the job done." 30

Make sure you are observing what is happening with your crops. Get in early and start getting rid of the weeds, nurture all new plants by adding manure where needed and you may want to consider doing some companion planting to support your crops. Grass will be growing very fast and you may want to cut it to mulch or use for compost. You may have some edible flowers in and around your vege garden that can be collected for drying or using fresh. Subtropical fruit trees will fruit at this time of the year if you are in the North. Now is also the time to mulch the trees you planted last winter.

You can now plant potatoes and corn, pumpkin, beans, lettuce and beetroot seed into trays. It's also time to transplant peppers, tomato, eggplant and melon seedlings into the vege garden, unless it's still quite cold and in that case leave it until next month.

Whiringa-ā-rangi (November–December)

"Iti noa ana, he pito mata."

"With care, a small kūmara will provide a harvest."

Any of your early crops can be harvested, this may include potato and marrow. Make sure you plant again to ensure ongoing supply of food from your maara for as long as possible. Edible flowers should still be available and you can mix them with salad greens. Salsify, chives, roses, carnations, heartease, nasturtium, borage, rocket, chamomile, lavender, orange blossom, elder flower, calendula, violets and red clover should all be flowering now.

Use ducks to clean up bugs, snails and insects that you might be having problems with now. Keep on top of the spring weed growth. Pull out all unwanted weeds before they go to seed. Make sure your newly planted trees are mulched for the summer and you have a system for watering them set up.

Raumati Summer

Hakihea (December–January)

“E tipu e rea mō ngā rā o tōu ao.”

“Grow up tender shoot and fulfil the needs of your generation.”

The garden reminds us of the importance of growing to fulfil our potential and how nurturing this type of growth makes the world a better place. This is the time of the year when plant growth is at its best. Celebrate this and maybe Christmas by enjoying a good supply of veges. You may be eating new potatoes, courgettes, beans, peas, baby carrots, beets, lettuces and salad greens and possibly the first season of basil. Strawberries are also at their best now.

Maintain high standards in your garden, keep those weeds out and make sure your trees have irrigation or are regularly watered. It's a good time to fertilise any subtropical plants that you may be growing, like bananas, sugarcane and taro. It's also a good time to plant taro if you have a wet, boggy, light filtered spot. Now is the time to begin liquid feeding any plants before they become too stressed.

Kohi Tātea (January–February)

“He tangata ano mā te mau, he tangata ano mā te katau.”

“A community can use all the skills of the people.”³¹

There is lots to do in the garden at this time of the year so get the whole whānau working together in the garden. Check your storage shed is good enough to store the coming harvest – you may even want to build a new one! Continue to check on your pests and manage your weeds. Keep regularly watering and liquid feeding particularly for young or stressed plants.

You can also keep planting some seed at this time to ensure extending your garden's crop. You can still put in late crops of corn, courgettes, beans and cucumbers in the North. You can also begin planting peas, carrots, lettuce, endive, fennel and first of brassica seed. Get brussel sprouts in now if you want them in your garden otherwise they won't be big enough to produce sprouts over winter. You can also plant early broccoli, kale and cabbage.

You may also want to get started on preserving any excess you have, and if you can, try and have a break!

Hui Tanguru (February–March)

“E ao te rangi ka uhia, he kai te whare wānanga ka tōroa.”

“As the clouds deck the heaven, so food prolongs the wānanga.”

There should now be some real abundance in your garden and you should be harvesting to store and preserve food for winter. You can also start planning for your autumn and winter garden.

When you harvest make sure you pay careful attention to its quality so that you can select the best seed for next season. There are a variety of ways you can preserve your food: pickling, bottling, drying, freezing, making jams and wines.

Keep on top of your pest control; do your weeding in the new moon and remove insect pests directly from the plants before you have to spray them. You can plant broccoli, cauliflower, cabbage, kale, celery, turnips, orach, rocket, lettuce, beetroot, florence, fennel, spring onions, endive, coriander, burdock, peas, broadbeans, swedes, parsley, carrots, silver beet and spinach.

Ngahuru Autumn

Poutū-te-rangi (March–April)

“Ngāhuru kai hāngai, kōanga kai anga kē.”

“At harvest time in autumn, one eats openly, at spring time one eats in a corner.”

Enjoy the fruits of the land as there should be plenty. Keep harvesting, storing and preserving. As you are harvesting your potatoes, kūmara and pumpkin for storage, make sure you do it at the right time of the moon, the waning 4th quarter, and make sure you keep the best ones for next year's seed. Burn or feed any bad products from the garden to the pigs, don't use it in the compost.

Keep young trees watered and make sure you get your manure and compost into the ground before you plant more winter veges. Liquid feed 3 days after the full moon.

Paenga-whāwhā (April–May)

“Moe atu i te tangata ringa raua.”

“Marry a person with callous hands, as they will be a great provider.”

Keep up with the storage of your harvest and make sure you do this when the moon is waning so that they will store well. Fruit picked when the moon is waxing will bruise and root far more easily. It is also important to dig potatoes on a hot and dry day.

Get your ground turned in for the winter months; spread and dig in manure, mulch and compost after the first rain in the new moon. Using pigs to clean up any crops and turn over the garden is good for meat too. Spray organic pest control spray on your fruits in the first waxing quarter of the moon. It is also a good time to plant spring bulbs.

Haratua (May–June)

“Nāu te rourou, Nāku te rourou, ka ora ai te iwi.”

“With your food basket, and my food basket, the people will be sustained.”

This is a time of thanksgiving and celebration. Your harvesting and storing of kai should be complete, and it is time to share the fruits of your labour with whānau. It is time to reflect on the past season and to prepare for the new season with wānanga.

Remove any dead or diseased trees now and have a last go at weeding the beds for winter. In the last quarter of the moon you may want to plant lupins or compost crops as well. Prepare for planting trees in the winter by digging your holes and mix your compost and manure in with the soil and mulch the sites. Broad beans can also go in while the soil is still warm and once the frosts come you can harvest your yams and Jerusalem artichokes.



Traditional Māramataka or Moon Calendar

A general guide for the moon nights and whether they are good for planting or fishing are as follows: ³²

(Translation Here?) New Moon

1. Whiro: The moon is still in the underworld and is hence unseen. A bad night
2. Tirea: The night when the first radiations of the moon become visible
3. Hoata/Ohoata/Ohata: The moon is visible and seen higher up, work in the garden can start
4. Ōuenuku: These nights are good for working the land
5. Ōkoro: Everything is growing
6. Tamatea-tutahi: It is not good. The moon rises higher still and grows larger
7. Tamatea-turua: It becomes good this night

(Translation Here?) First Quarter

8. Tamatea-tutoru: That is a good moon with no rain
9. Tamatea-tuwaha: Average night
10. Huna: Everything is hidden. A bad night
11. Ari: A bad night, particularly for fishing
12. Māwharu: Things grow full and tasty.
Good nights for food activities start here up until Korekore which is no good and the finish
13. Ohua: A good night
14. Atua: The moon becomes big on this night. This is a good night

(Translation Here?) Full Moon

15. Turu/Oturu: The moon is now filled out. Like tears, things are full and droop. He pai
16. Rakau-nui: A good night
17. Rakau-matohi: The moon now wanes. A good night
18. Takirua: The moon is losing its brightness. A good night
19. Oike: The moon is waning. A good night
20. Korekore-tutahi: A bad night
21. Korekore-turua: A bad night

(Translation Here?) Last Quarter

22. Korekore-piri-ki-ngā-Tangaroa: A bad night
23. Tangaroa-a-mua: The moon sinks into the sea. Good for fishing, not for planting
Tangaroa nights: These nights are important as they are good for nurturing and good for work in the garden and for fishing on various days
24. Tangaroa-a-roto: The moon sinks into the sea. Good nights for the delicacies of the sea
25. Tangaroa-a-kiokio: The moon sinks into the sea. A good night for everything
26. Otane: This is a particularly good night for growing
27. Orongonui: This is also a good night for growing
28. Mauri: The moon has nearly set, and has now darkened. Good for planting root crops
29. Omutu: The moon has set. This is a bad night
30. Mutuwhenua: The moon has expired, the night is dark. Everything has weakened. A bad night

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