



Laura Hesse



USE + VALUE RENEWABLE
RESOURCES + SERVICES

GOATS IN A PERMACULTURE SYSTEM

Words by Beck Lowe

Goats are entertaining, intelligent and productive animals and can offer a lot of inputs into a permaculture system.

Due to their varied palate, they can be very useful in managing woody and weedy vegetation, as well as blackberries. In fact, much of their feed can come from excess growth around the garden.

Having fresh milk on hand is also a strong motivator for many potential goat keepers, with homemade goats cheese being a delicacy. Goats can also be kept as a meat source, as well as for their manure, which adds fertility to soil. Unlike larger hooved animals, goats can be kept in urban areas, as long as they are taken out to forage daily.

BENEFITS OF KEEPING GOATS

Manure & mulch:

Goats provide useful manure that can be used for composting and adding directly onto the garden or orchard. It is hard to collect in the paddock but easy to clear out of the goat shed, especially if it is mixed with straw or wood shavings from the floor.

Goat manure comes out in neat pellets, making it easy to collect and spread around the garden. It is also milder than chicken manure and similar in nutrients to cow manure, depending on what the goats are fed and their conditions.

If you are feeding goats branches, the remaining sticks can be used as a coarse mulch around fruit trees (useful for stopping chickens scratching up the goat shed mulch laid underneath) or for kindling. Otherwise they can be mulched and used wherever needed.

Vegetation control:

Goats are great for managing weedy, overgrown areas. Many of the plants that we find problematic in our systems are relished by goats, even very prickly plants such as blackberries, which have a tendency to take over and may otherwise be sprayed with herbicides.

Goats are less effective at mowing lawns as they don't eat the grass down to a very low level, although they will keep it short. They will also manage thistles and other low-growing plants. But beware! Don't allow them near your fruit trees as they can seriously damage them in a short space of time.

Milk:

If you have tried commercially produced goat milk and didn't like it, do not despair – fresh, unpasteurised goat milk tastes completely different! A goat will give around 1-2 litres of milk per day, and more at the start of lactation. Milk can be made into cheese, yoghurt and kefir.

Milking can be undertaken either once or twice per day. Twice a day will give you more milk, but less flexibility in your day. Goats can be milked year round and some milking goats can produce for years without birthing again.

Being home at a particular time each day to milk could be seen as a burden, but this is not an issue if you have a home-based lifestyle. Consider sharing the milking with a neighbour to give both households flexibility and fresh milk!

If kids are kept on their mother it is less stressful for everyone. They can be separated at night with a mesh divider so mum can be milked in the morning and the kids can drink during the day. This also provides flexibility—if you won't be home you can leave them together and you won't need to milk.

Meat:

Goat meat makes for good eating and keeping goats for meat can be productive. Goats generally produce twins and meat breeds can thrive in areas where other meat animals might not. Hides are another benefit of producing goat meat.

REQUIREMENTS

Company:

Goats are very social animals, so a solitary goat will not be happy. They need at least one companion, although this can be another species, such as a sheep.



INTEGRATE RATHER
THAN SEGREGATE

URBAN GOAT CO-OPERATIVE

Words by Maude Farrugia Photos by Emma Belyea

Hibi Farm is nestled on a sprawling suburban block in a quiet court in Melbourne's not-quite-inner north. You could be forgiven for forgetting you were in the middle of postwar-built suburbia and instead had been transported back in time to the Swiss Alps, Heidi-style.

Chickens peck around the goat pen, which sits at the back of the yard, beyond the extensive fruit and vegetable gardens. Michi Pusswald, a householder at Hibi Farm, scrapes out the straw bedding. His wife Angelica nuzzles Tessie, a bearded Toggenburg milking goat, leading her up onto the milking stand. Michi and Angelica are on the 'goater' shift this morning, and that means an early start.

Hibi Farm sits at the centre of the Hood; a loose collective of local households living the good life. Central to the operation of Hibi Farm is the goat co-operative. Milking the goats is a daily ritual undertaken by one of the 15-odd official 'goaters' rostered on. This milk is shared between their households and then further afield as currency in bartering arrangements with friends and neighbours.

'Instead of having
a dog, you can just
have a goat'

HOW IT ALL STARTED

The goat co-operative is well established. Angelica, her sister Maria and their families moved into the area around eight years ago. Inspiration struck when Maria's husband Edwin saw a Burke's Backyard article on backyard goats. It took them about a year of careful research and planning before they got their first goats.

'We would buy bags of manure for the garden and it was the idea that we were constantly buying stuff in, that made us think; wouldn't it be nice to have animals to produce that for

the garden,' recalls Angelica. Thoughts of other benefits of keeping goats only came later when research around milking was done. When the goats arrived, with their unique personalities and loving natures, the co-operative members were sold on the benefits of keeping them as pets and companion animals.

'Instead of having a dog, you can just have a goat,' says Edwin. 'Although I'm not sure that I'd want the goat sleeping on our bed.'

MILK

The goats provide seasonal milk for the co-operative members and cover most of their needs. Things can get a little lean in winter, so some families in the co-operative choose to supplement with shop bought milk, but much of the time the goaters are dealing with more milk than they can handle.

'It's a lot of work and a lot of milk, so we started including one extra household, and then added another and another,' says Maria. One of their first goats, a Saanen (the largest of the milking breeds), produced so much that the co-operative couldn't cope with the amount of high energy feed and milking she required. 'We actually don't want the most productive dairy goats because they're tricky for us to manage. We want one with an easy personality, one who is robust and friendly to children.'

GOAT MENTOR

'We have a goat mentor,' Maria explains. This is the breeder who sold them the goats, and his ongoing support and advice to the co-operative is vital. 'We'd definitely recommend getting a mentor if you're wanting to keep dairy goats,' Edwin says. 'It's not really the sort of thing you can just learn in books.' Their mentor has generously shared advice on everything from milking to common goat ailments, as well as his passion for keeping the animals. 'He's really just so happy about what we're doing; that a new generation of people are interested in keeping goats,' says Angelica.



Dana Wilson GaiaCraft

PROFILE



OBSERVE AND
INTERACT

ROSEMARY MORROW: A PERMACULTURE PIONEER

Edited from interviews by Delvin Solkinson, Dana Wilson, Annaliese Hordern, Robyn Rosenfeldt and Kym Chi

Living a committed life of service to humanity and this beautiful planet is natural for Rosemary (Rowe) Morrow. She has been working and supporting people in areas of need for more than four decades through teaching permaculture in places where others don't go. Without permaculture, the needs of people and the land would be less adequately met.

Her work has helped establish permaculture as a globally relevant, accessible and practical way for addressing pressing planetary problems. Rowe's career in permaculture has been dedicated to helping people in the greatest need. She has journeyed to meet and learn from farmers and villagers in some of the most challenged places. She seeks to offer information that makes a difference in places affected by worsening climate change, and countries facing the impacts of financial crises.

As climate change impacts become more extreme, Rowe has offered courses on local resilience and designing for disasters. She has trained and empowered other people around the globe to do aid work and offer service. She often teaches low-cost or free Permaculture Design Certificate courses for communities, then assists in implementing their designs. This reflects permaculture's ethics of care.

Together with co-founder Lis Bastian, Rowe established the Blue Mountains Permaculture Institute, which offers diplomas to people who have done outstanding work yet cannot access or afford accreditations through other pathways.

Rowe has always been on the earth trail in some way. In her childhood she played in the bush and climbed trees. 'Luckily I had parents who didn't feel the need to supervise children,' Rowe says. 'I grew up on farms and around 11 years old I decided I wanted to go and live on a huge cattle station. I said

that regularly and it became my mantra. When I was 15 I got a job with a travel agent, earning 45 pounds and two shillings, and bought a plane ticket from Sydney to Darwin.'

In Darwin she worked with Qantas before heading into the outback. 'It was 80 miles to the next-door neighbour and the rivers flooded five miles wide. The droughts and the heat were awful, as were the mosquitoes and flies, but I loved it. There were thousands of head of cattle and five hundred head of horses. After about five years, family circumstances took me back to Sydney but I always thought I would return.'

Agricultural science studies came next, but Rowe found the course to be 'reductionist, boring and poorly taught'. She decided to travel to Paris to take up a scholarship at the Sorbonne to study rural sociology. 'I started doing a PhD but left and volunteered at L'Arche in northern France for a year, working with people with intellectual disabilities,' she says. 'I learned so much that year. I learnt respect for everyone. I began to learn how to communicate when you don't have words.'

'It is everyone's right to have the tools to feed yourself and your family'

After completing a Masters in Rural Development in Reading, UK, Rowe was sent to Lesotho in southern Africa, where she lived for four years. 'I was engaged in the politics of South Africa – it was the time of the Soweto uprising and apartheid, and I got caught up in all of that,' she says. 'Desmond Tutu was the bishop of Lesotho and you'd see him around town every day. However I was confronted because I did not know



CATCH AND
STORE ENERGY

EARTHSHIP IRONBANK

Words and Photos by Koren Helbig

Nestled among gums in South Australia's Adelaide Hills lies an elegant home, made largely of rubbish – old car tyres, glass bottles and recycled cans. Such unconventional materials are key to constructing an Earthship, the now global 'radically sustainable' building technique pioneered by renegade American eco architect Michael Reynolds since the 1970s.

It was a visit to Adelaide by Michael himself that sparked this project at Ironbank, one of the first official Earthships to be built in Australia. Michael had popped by to speak at UniSA in 2009 at the behest of Martin (Marty) Freney, an industrial design lecturer there. Afterwards, the pair headed up to Ironbank with a few students for a hands-on lesson in creating the Earthship's fundamental building block; tyres ram-packed full of soil, which they casually arranged into a U-shaped wall. In the years that followed, Marty gradually realised he had the makings of his own small Earthship and after gaining council approval he launched the project in earnest.

An official Earthship must meet six design principles:

- produce its own energy
- produce its own water
- treat its own wastewater
- use only passive heating and cooling
- be constructed from sustainable and recycled materials
- produce its own food

'It's called an Earthship because it's like a boat on the ocean that has to do everything for itself,' Marty says. He estimates ticking all those boxes cost about \$170,000, though he saved truckloads on labour as volunteers came from around the world to learn while lending a hand with construction.

CONSTRUCTED USING SOCIETY'S WASTE

All up, about 1000 old car tyres, pounded full of soil, went into

this Earthship's walls and neighbouring rainwater tank. 'Tyres are all over the planet – anywhere you find people, you pretty much find tyres,' Marty says. 'I actually get a real blast out of going to the tyre store and picking up old tyres.' In a similar attempt to reuse something too often sent to landfill, the internal walls are dotted with the muted greens, whites and browns of glass bottles, necks cut off and two bottles taped together to create a kind of circular brick.

Loads of old bottles and recycled cans went into the bathroom too, all covered with cement and mortar. That was polished to a waterproof shine using tadelakt, an ancient Moroccan lime plaster that Marty and his volunteers painstakingly burnished by hand, rubbing the surface with rose quartz stones. In the Earthship's main living area, floors were made from sand and straw, mixed to make a hard earthen floor then sealed with linseed oil.

NATURAL HEATING AND COOLING

Earthship Ironbank's main living area, which serves as a combined bedroom, kitchen and living room (other Earthships have three bedrooms or more), is dug into the hillside and covered over with soil. The earth creates a kind of thermal wrap that keeps the room warm in winter, helped out by a fireplace that doubles as an oven and stove, and remarkably cool even on the hottest of Adelaide's fierce summer days.

The home is flooded with natural light thanks to huge floor-to-ceiling double-glazed windows that act as a powerless heating and cooling system. North-facing, the enormous windows soak up the low-hanging winter sun and work as a natural heater, while eaves block the baking heat of the summer sun. 'It's performing quite well here in the summer. If it's 40°C outside, it's 25°C in here,' Marty says.

But the most crucial component of this overall system is mostly hidden from view. Dug about two metres beneath the Earthship are two large 'earth tubes' that pop up in the main living area, through a grille cut into a bench chair. When the



Robyn Francis



Shutterstock



Robyn Rosenfeldt

Clockwise from above: Bushfood harvest; Macadamias on the tree; Warrigal greens; Finger limes. **Following page, top:** Riberry fruiting. **Last page, L-R:** Lemon myrtle tea; Warrigal greens and macadamia pesto.



MorePix



USE AND VALUE
DIVERSITY

GROW YOUR OWN BUSH FOODS: A TASTE OF THE BUSH IN THE BACKYARD

Words by Robyn Francis

The fruits and aromatic leaves of the tropical and subtropical rainforests of Eastern Australia provide a whole new palette of spices, fragrances and flavours for the adventurous cook. These uniquely Australian flavours, merged with the creativity stimulated by living in a multicultural society, readily give rise to an endless array of culinary innovations.

It's surprising how many of these plants are frequently included in regular landscapes, native gardens and public plantings in parks and streetscapes in Sydney and further south; some are quite frost hardy.

Most of our subtropical bush foods come from rainforest understorey environments; sheltered, frost-free microclimates with dappled shade. In the garden these understorey plants will grow successfully under the canopy of taller trees or in protected areas close to the house where they receive some shade throughout the day or are less exposed to frost. It's also surprising how well many rainforest plants grow in full sun, and more sunshine definitely increases yields of fruiting plants.

You don't need a lot of space to grow a small collection of rainforest bush foods, and integrating these plants into a garden landscape has rewards beyond pleasing the taste buds. Bush foods in the garden provide habitat, forage and attract native birds, butterflies and many beneficial insects. They contribute to species conservation, as some rainforest bush foods are threatened or endangered, such as the Small Leaf Tamarind.

Bush foods ecologically enhance native landscapes and can be included in windbreaks, privacy screens and regeneration areas as restoration ecology.

RAINFOREST BUSH FOODS:

Atherton Raspberry *Rubus fraxinifolius*

Growing: Suitable for the larger garden or rural property, the Atherton Raspberry needs space and diligent management

so it won't take over. Regular mowing around the designated raspberry patch will keep it in check. In smaller gardens you might try growing it in a large container. It has a long bearing season from May until October, with the occasional fruit forming through to early December.

Uses: This variety of native raspberry is a delicious table fruit. The fresh fruit freezes well and makes great sauces, preserves and a garnish for all kinds of desserts.

Davidson Plum *Davidsonia pruriens* var. *jerseyana*

Growing: This tall and slender rainforest plant will grow and bear in the tiniest garden space. It prefers a semi-shady location and does well under the canopy of taller trees. The plum-like fruit grows in clusters along the stem, ripening in early summer, usually December to early January.

There is another variety known as the Atherton Tablelands Davidson Plum, which grows a bit taller and bears its fruit in late Autumn.

Uses: The flavour and colour of Davidson Plums are quite intense. While being too tart for most of us to eat as a fresh fruit, in cooking it has fast become one of my favourite bush fruits. A little goes a long way to colour and flavour ice cream, mousse and sweet sauces. It makes a sensational fruity savoury sauce and gives kangaroo goulash a rich fruity tang. I also love it as a liqueur, steeped in brandy and sugar. Its skin contains tannins which makes it an ideal crop for making fruit wine.

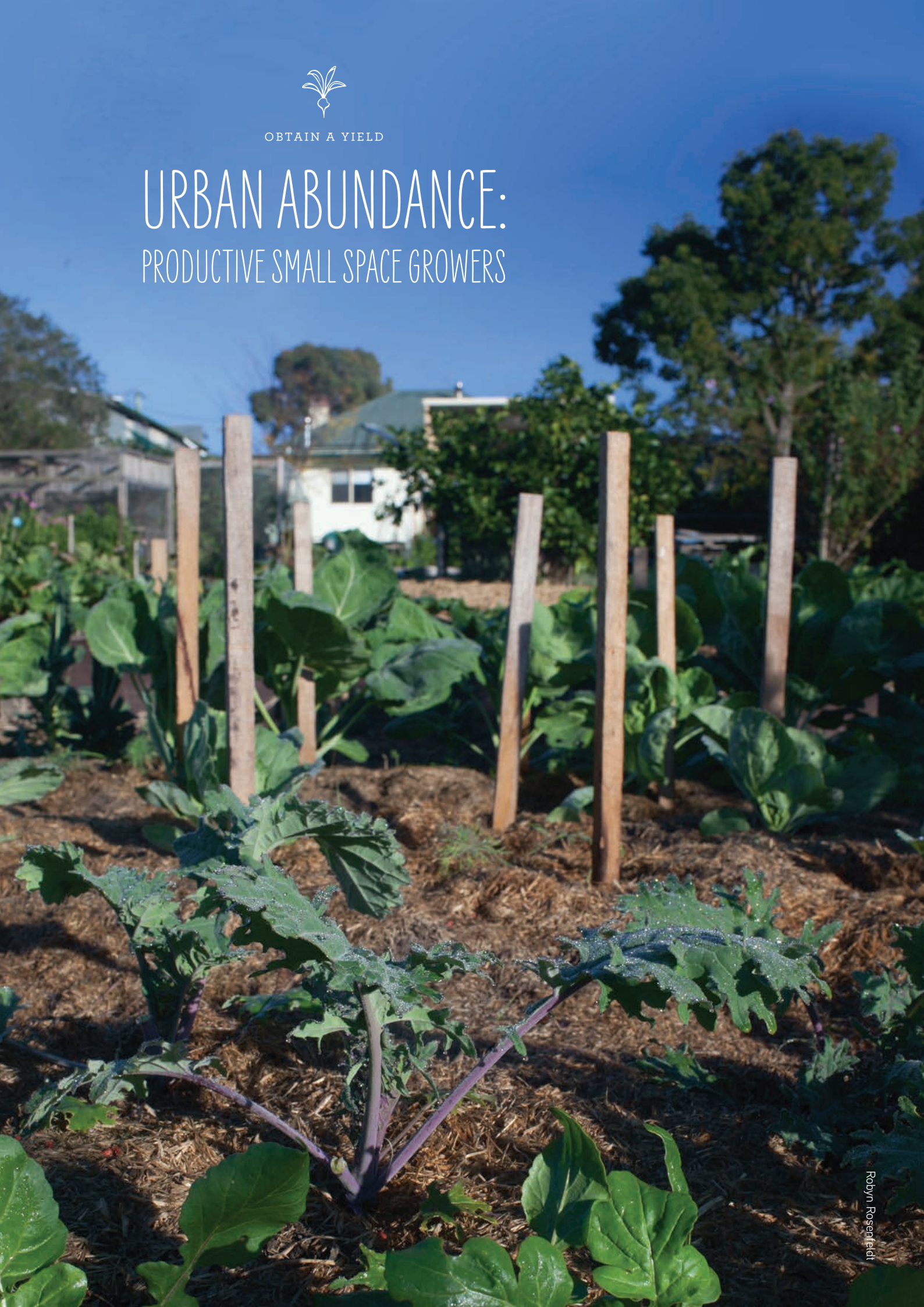
Finger Lime *Microcitrus australasica*

Growing: This small thorny tree, well loved by finches as a safe nesting habitat, is a member of the citrus family, though it looks nothing like your usual citrus tree. A hardy plant, it can handle full sun, shade and even some frost. There are several varieties with different coloured skin; green, black and red. The red-skinned fruit contains pink flesh. The tree doesn't spread very wide (1–1.5 m) and can reach a height of around 3 m, so it doesn't require much space and makes a virtually



OBTAIN A YIELD

URBAN ABUNDANCE: PRODUCTIVE SMALL SPACE GROWERS



Robyn Rosenfeldt



Amy Plessel



Amy Plessel

KAT LAVERS

Words by Samantha Allemann

The Plummy sounds like a sprawling countryside property. Its garden beds grow an abundance of vegetables, with surrounding fruit and nut trees underplanted with shrubs, herbs and flowers. Bubblegum grape shades the house and there's a greenhouse with bananas and babaco. A quail aviary sits by the side of the house and on the southern side are avocados, feijoas and a cherry guava.

Yet all of this is contained on a 280 m2 block in Melbourne's inner city suburb of Northcote, at the home of permaculture designer Kat Lavers. Last year, the Plummy provided 350 kg of herbs, vegies, fruit, eggs and honey, with Kat only spending half a day a week gardening. 'Sometimes I dream about planting oaks and chestnuts, but the reality is I don't have the time to manage more than I've got,' says Kat.

Kat is creative in overcoming spatial limitations, saying it has made her a better designer and gardener. 'You can't bury your mistakes under the rug!' she says. 'Observation and interaction are virtually constant and therefore so is the learning. It also means that you can concentrate your compost, mulch and water resources on a smaller number of plants. Many gardeners don't get these basics right and have poor yields from much larger gardens.'

Keeping produce records and a garden diary helps Kat to refine her planting plans, with much thought going into what she grows. 'I'm careful to only grow plants that I actually use. I love eating my way through the seasons —I used to grow warrigal greens but realised I hadn't bothered to harvest them

for years!' Kat says. 'I choose vegies where I can eat most of the plant for most of the season, trial varieties to find the most productive for my microclimate and use poles, trellises and pergolas to grow climbing varieties.'

'I'm careful to only grow plants that I actually use'

'I embrace weeds as a bonus crop of food and animal fodder,' she says. I have a small army of perennial vegetables (wild rocket, chokos, arrowroot) to reduce work. My fruit and nut trees are designed to provide shelter for the house and garden, and crop in sequence for a succession of fruit all year round.'

Kat recommends quail as a fantastic egg-laying alternative to chickens for small gardens. Her quail also provide compost through a deep litter system made up of leaves and sawdust. All of the Plummy's organic waste is processed on site thanks also to a worm farm and a home-built composting toilet.

Kat spends hours wandering around the garden, immersed in the magic of it all. 'I love watching the seasons come and go, learning more about my plants and seeing all the creatures that come to visit,' Kat says. 'The anticipation of juicy ripe tomatoes when the first warm weather arrives...pickled cucamelons, quince paste and feijoas in autumn, sweet carrots and crisp radicchio leaves in winter, and leeks, greens and herbs in spring.'