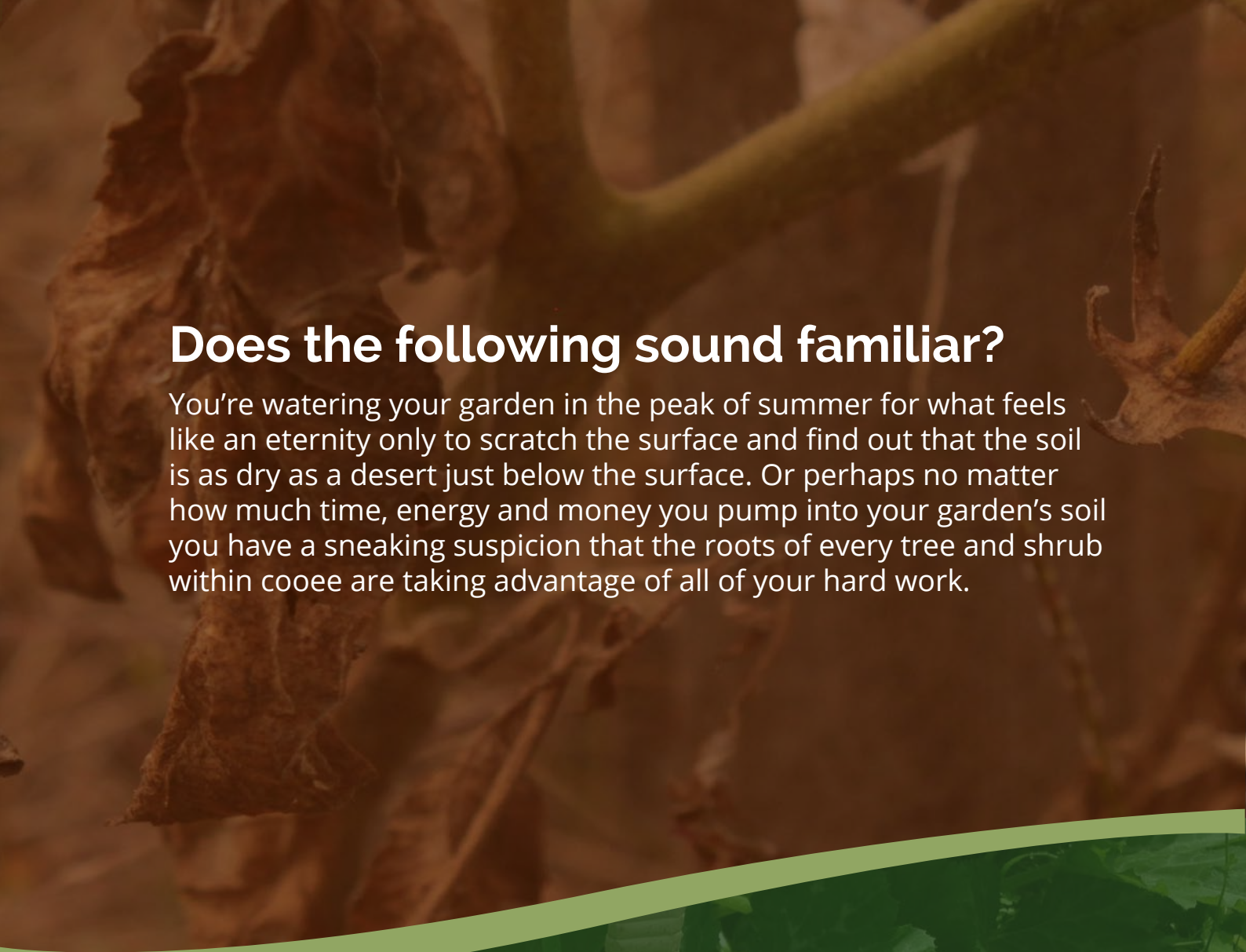


A Very Edible Gardens' Quick Start Guide

Wicking Bed 101





Does the following sound familiar?

You're watering your garden in the peak of summer for what feels like an eternity only to scratch the surface and find out that the soil is as dry as a desert just below the surface. Or perhaps no matter how much time, energy and money you pump into your garden's soil you have a sneaking suspicion that the roots of every tree and shrub within cooee are taking advantage of all of your hard work.



The wonder of wicking beds

With a wicking bed, you can say goodbye to these annoying quirks of backyard gardening and embrace the extra time you now have as well as a lush perfectly hydrated garden. Imagine this. You're lounging in your favourite chair, sipping a coffee or tea (or perhaps something stronger?), while your plants are silently drawing just the right amount of water they need from a reservoir beneath them. Your veggies are lush and strong and you feel a strong sense of pride in your garden even feeling a little smug about your new gardening prowess when visitors pop by!

Hey there, gardening enthusiasts and green thumb hopefuls!

Welcome to the magical world of wicking beds, where your plants practically water themselves and your garden bounty becomes the envy of the neighbourhood.

There's nothing like the pride and sense of abundance of fresh home grown produce! The veggies are fresher, healthier, more delicious, and more sustainable than anything you can buy at the shop.

But veggies can be fickle things. They do need care, and protection from the extremes of climate.

Enter the wicking bed! Wicking beds can make our lives, and those of our veggies, much cruiser. Wicking beds can produce more delicious food, more easily, all while reducing water use.

But if you've tried making wicking beds yourself, or just searched online for information, you may have discovered it's the wild west of DIY strategies out there, featuring the good, the bad, and the ugly.

We've been making and using wicking beds for fifteen years and—with a few useful learning experiences along the way(!)—we have discovered and refined some effective ways of building them that guarantees success.

This booklet isn't a detailed step-by-step guide. We have free videos online for that, as well as a written guide that comes with all our kits. But what it will do is help you:

- decide if wicking beds are right for you
- know which strategies really work, and common mistakes to avoid

Whether you decide to use our kits or installation services, another business, or just go full DIY, this little booklet can be your guide to getting it right the first time!





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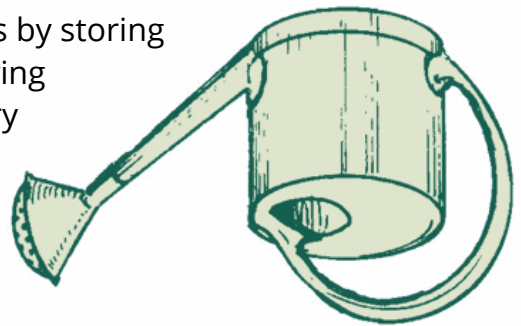
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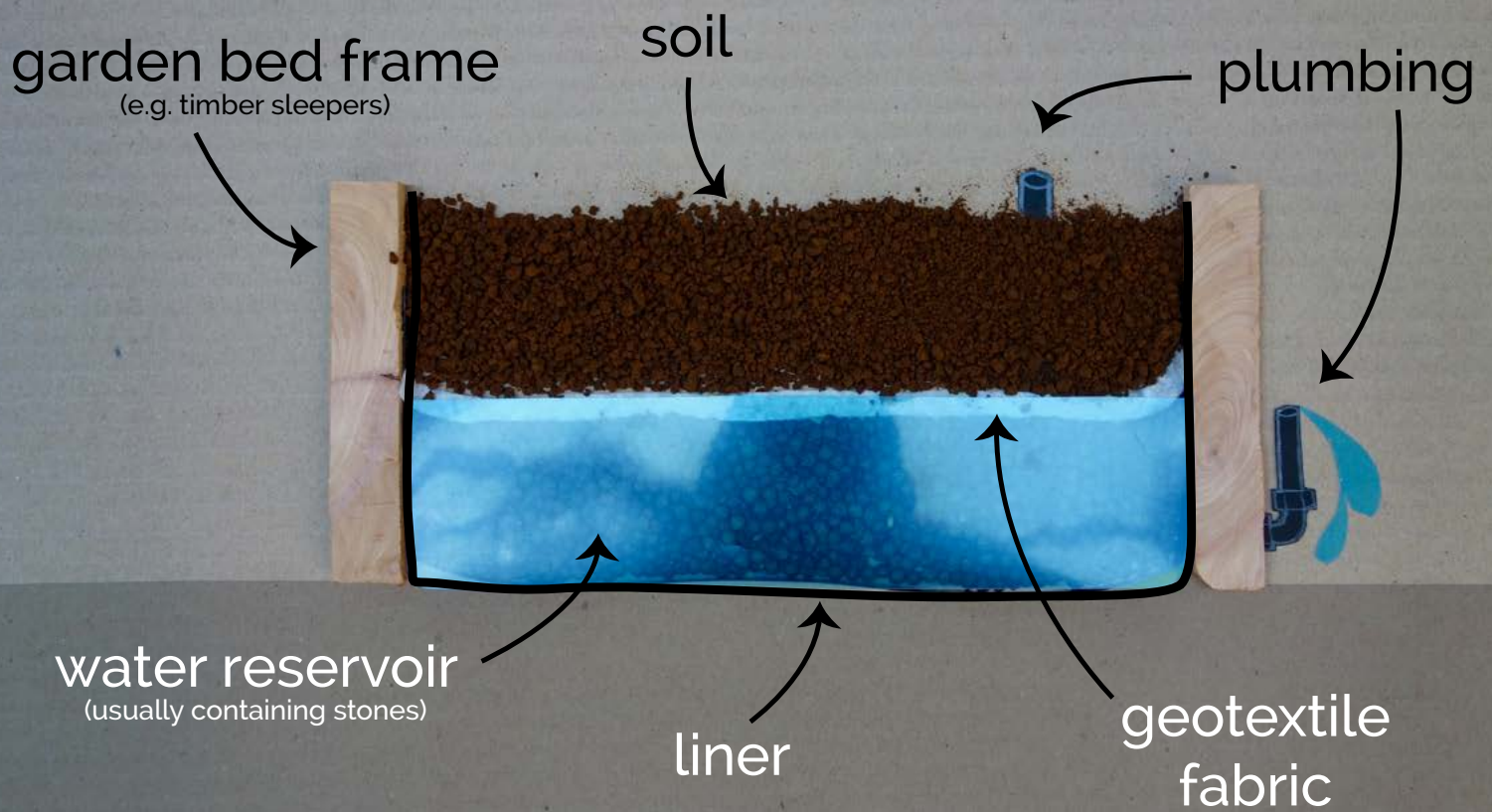


What Is a Wicking Bed?

Upside-down watering!

In a nutshell, wicking beds are a smart watering system that waters your plants from the bottom up. A wicking bed works by storing water in a reservoir beneath the soil, with water moving upwards through the soil via a process called capillary action or capillary rise – or simply ‘wicking’. It’s a system that keeps your plants happily hydrated whilst reducing surface evaporation, and comes with a whole host of added benefits.





Breaking it down, a wicking bed consists of 6 main components:

1. The garden bed frame

This can be made from wood, metal, brick – really anything you’d use for a raised veggie bed. Some setups come sealed, such as plastic tubs, which negate the need for a liner.

2. The liner

The liner holds the water in! It’s essential to choose a liner that’s heavy-duty and safe for use with edible plants. (Our liners are certified potable water grade, which is ideal.)

3. The reservoir

Located beneath the soil, the reservoir stores water that is ‘wicked’ up through the soil to hydrate your plants. The reservoir is typically filled with sand, scoria, or ‘screenings’. The material has three jobs: hold the soil up, store water well, and wick effectively – and not everything fits the bill!

4. Geotextile fabric

This fabric layer allows water to pass through, while preventing soil from falling into the reservoir.

5. The soil

Sitting on top of the water reservoir, this is where your plants will grow. The soil is typically a blend of a nice loam soil and compost, providing a fertile environment for your plants.

6. The plumbing

The plumbing system in a wicking bed consists of two main parts – an inlet pipe to fill the reservoir with water, and an overflow pipe to allow excess water to escape, preventing oversaturation of the soil.

How Does It Work?

What's this sorcery that makes the water rise from below?

Well there's no black magic involved, in fact it can all be explained by our good friend science.

Put simply, water molecules stick to surfaces and when confronted with the right materials they can scramble one after the other to move higher and higher upwards – seemingly defying gravity. Visualise dipping the end of a paper towel into a glass of water – the water will rise up the paper. In a wicking bed, the water moves up small stones, from the reservoir into the soil, higher and higher until it can't rise any more. Your plant's roots grow down and find their happy place beneath a relatively dry top layer of soil. That dry surface layer is actually one of the reasons wicking beds are so water efficient!



Why Choose Wicking Beds?

Save money, time, water and the environment.

Here are just a few good reasons to upgrade to wicking beds.

1. Water conservation

A study by the University of South Australia discovered that wicking beds are champions at saving water. The beds grew 50% more produce per litre of water compared to *best practice* surface irrigation!

2. Easy watering

Forget the guesswork of when and how much to water your plants. With our system at least, there's a visual indicator that makes it super easy to know when it's time to refill the reservoir, and when it's full. Watering has never been more hassle-free!

3. Thriving plants, more produce

Because of the constant supply of water, your plants never have to stress about their next drink. This leads to healthier growth and fewer pests and diseases. With the soil being isolated there is no competition from tree roots. It's a paradise for your veggies! That's why, per square metre, wicking bed grow more!

4. Grow on any surface

From wooden decks, to concrete, to underneath hungry gum trees, it's a self contained growing system!

5. Less weeding

An inherent advantage of the wicking system is its ability to keep the soil surface relatively dry, making it a tougher terrain for weeds to sprout. Prepare to bid farewell to those tedious weeding sessions!

6. Fewer slugs and snails

If you're tired of battling these slimy garden pests, you'll be pleased to know that the drier surface conditions of wicking beds are not their cup of tea.

7. Rainy day solutions

Did you know that a Very Edible Gardens style wicking bed can also manage excess water? In winter, or whenever your wet season is, you can switch your bed to 'wet weather mode', turning it into a drainage system! It's a smart way to handle the rainy season.

8. Accessibility

A bonus feature of wicking beds is their raised design. This puts your vegetables at a comfortable height, making it easier to tend to your plants and reducing strain on your back.

Reference:

Semananda, N. P. K., Ward, J. D., & Myers, B. R. (2016). Evaluating the Efficiency of Wicking Bed Irrigation Systems for Small-Scale Urban Agriculture. School of Natural and Built Environments, University of South Australia.



Some Real Talk

Are they right for you?

Like anything else there are some things to consider too.

1. More expensive

Wicking beds typically cost a bit more to set up than non-wicking beds. It will pay you back in produce over time, but there's more of an initial outlay.

2. More materials

Wicking beds require some non-renewable materials – in particular, poly pipes and liner. We minimise the impact of this by using products that are durable and won't need replacing for the life of the wicking bed, and when that day finally comes, they are recyclable.

3. Trickier to install

Wicking beds require some attention to detail to build. Get the design or build wrong, and they can leak, over-saturate the soil, or be too dry. Rebuilding them isn't fun so you want to get it right the first time! Our kits of course are well-designed, and make the build easier, with instructions to guide you through the process.

4. You can break them (if you try hard enough)

If you drive a tomato stake into a wicking bed too deep and enthusiastically, you can pierce the liner. So big stakes are out, but A-frames (pictured above) and other solutions allow you to easily grow climbing plants.



Setting Up Your Wicking Bed

Things to consider and top tips

Very Edible Gardens have been at the forefront of wicking bed installations for over 10 years, so we've seen the good, the bad and the downright dodgy when it comes to setting them up. With this in mind, you might say we're a bit partial to doing them a certain way in order to guarantee success.

Below, we'll take you through the crucial elements when building your wicking beds and share a couple of savvy tips for choosing the right materials and techniques.

Remember, our DIY wicking bed kits come with full instructions as well as step-by-step videos so you can watch along and get it done and be sipping that cuppa in the glory of your new garden in no time.

1. Position Your Garden

Location

Situate your bed in a sunny and easily accessible part of your garden. This will allow for optimal plant growth and ease of maintenance.

Access

Observe how you access your garden and move through it. Place your wicking bed/s so that it accentuates the flow of the space rather than blocking it. Pay attention to the areas around where your beds will be and make sure there is enough space for the type of access you will need, like walking, wheelbarrows or wheelchairs and walking frames.

Surface

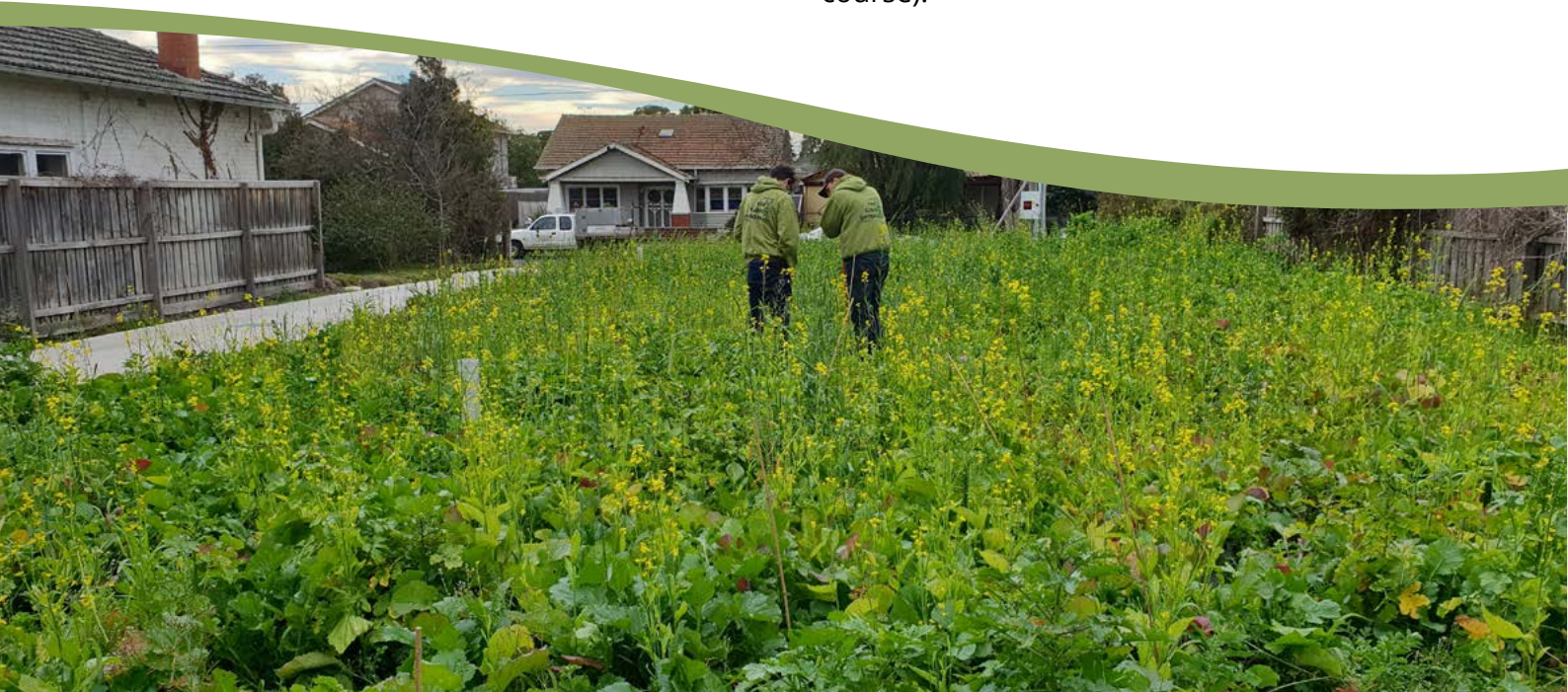
Wicking beds can usually go onto any surface that is not too rough on the liner. A free-draining surface, like sandy soil, rock dust or toppings is great for timber beds to keep the timber dry. Ensure the surface is firm and level before starting.

Slope

Whilst you can install a wicking bed on a slight slope, being level is best. Remember the water reservoir layer should always be level inside the beds and the soil depth will reflect the slope with a change in depth across the bed.

Orientation

If possible, consider a north-south alignment to bed rows to allow the sun to reach both sides of your crop rows. Of course an east-west orientation works fine too – but it can help to plant taller veggies on the south side and shorter veggies on the north side (for those of us in the southern hemisphere of course).



2. Construct Your Raised Bed

Materials

We like using sustainable timber. In particular Monterey cypress. It looks good, smells good and is easy to work with. But you could use corrugated iron beds (there can be complications with support struts getting in the way of liner though) or repurposed materials like IBCs (they degrade in sunlight so should be painted) for your bed.

Ethical sourcing

If choosing timber, aim for non-treated and sustainably sourced varieties. It's always a good idea to inquire about sourcing practices when purchasing. Our timber is from farm shelterbelts, salvaged at the end of its life by small scale family mills.

Size

The width should be manageable. Consider 60-90cm for a single-reach bed (access from one side) and around 1.2m to 1.4m for a double-reach bed (access from both sides). Remember that the space around your beds is equally as important for an accessible garden as mentioned previously.

Structure

If using timber, ensure your bed is built strong by using the correct bracing and is screwed into sturdy corner posts rather than into the end grain of the adjacent timber. This will provide a solid foundation for holding all that weight. (If you're in Melbourne, our timber kits come pre-drilled in the right spots for good strength!)



3. Add a Waterproof Liner

Choosing a liner

Invest in a heavy-duty liner that is certified safe for contact with drinking water. This will ensure the longevity of your bed and avoid any nasties that may affect the health of you or your plants. VEG liner ticks all of these boxes. We started buying in bulk the best liner we could find that was suitable for use in wicking beds so we could share it with the rest of the DIY wicking bed community.

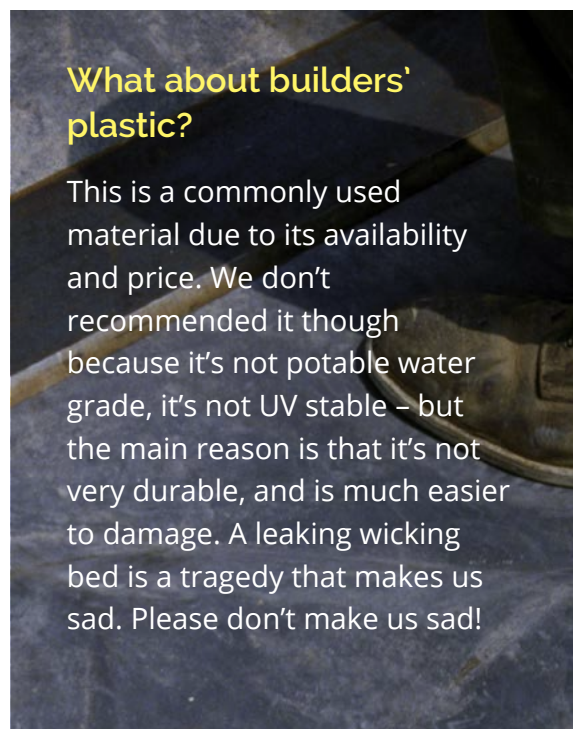
Installation

When installing the liner, check the bed for sharp objects beforehand to avoid puncturing the liner. The liner should fit snugly and securely within your raised bed.

It helps if you have some clamps to secure the edges. Then move around the bed tucking and folding each corner like an inside-out birthday present.

What about builders' plastic?

This is a commonly used material due to its availability and price. We don't recommend it though because it's not potable water grade, it's not UV stable – but the main reason is that it's not very durable, and is much easier to damage. A leaking wicking bed is a tragedy that makes us sad. Please don't make us sad!



4. Install the Plumbing

Inlet or filler

Because wicking beds aren't watered like a normal veggie bed, you need an 'inlet' to get the water straight down to the reservoir.

We use a combination of 25mm poly plumbing parts to create an assembly that allows a good flow of water in and out of the bed. Our inlets consist of a handy tap connector attached via a poly pipe to a 1m length of "agi pipe" to make filling the bed a dream.

Outlet or overflow

For the outlet, we use a tank fitting, elbow, riser and plumbers' tape which allows us to create a water-tight seal as well as being able to twist the outlet riser to have full control over the water height inside the wicking bed. In other words, you can switch to 'drainage mode' or 'wet season mode' to avoid overly wet conditions in the soil.

Top tip!

Avoid the old style wicking bed outlets. These sit at the same height as the top of your reservoir. They don't allow you to monitor the water level or allow you to easily drain the wicking bed.



4 in 1 Plumbing!

The VEG style plumbing:

- Acts as an overflow so you can't over-water the bed.
- Lets you easily see the water level inside the bed, so you always know when and how much to water.
- Allows you to drain the bed every couple of years to avoid build up of salts.
- Let's you put it in 'rainy season mode' for drainage and optimum moisture in wet weather.



A VEG wicking bed conversion kit with heavy duty potable water grade liner and multi-purpose plumbing



5. Fill the Reservoir

What material

Ideally, fill your bed with 7mm 'screenings', also known as 'aggregate'. Bluestone or granite screenings both work fine and are readily available at garden and building centres. This 7mm size is good for capillary action, water storage and also water drainage when the bed is placed in drainage mode.

Water

Once you've got your screenings to about the right height, use water to level them. This will ensure even wicking across the bed and the correct hydration level to stop your soil from becoming too wet.

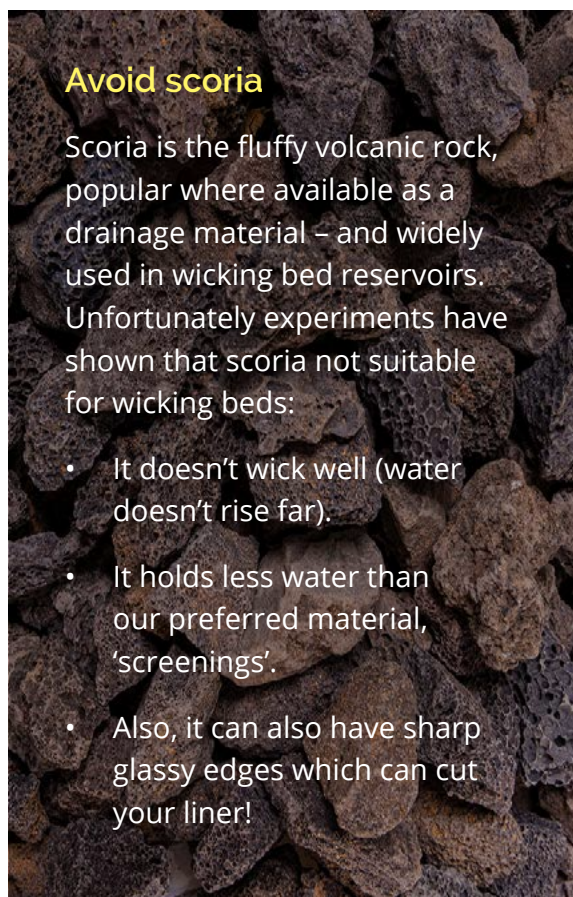
Adjust the outlet pipe

At this point we cut the overflow pipe so its top aligns with the water level. This sets your reservoir height, preventing soil flooding.

Avoid scoria

Scoria is the fluffy volcanic rock, popular where available as a drainage material – and widely used in wicking bed reservoirs. Unfortunately experiments have shown that scoria not suitable for wicking beds:

- It doesn't wick well (water doesn't rise far).
- It holds less water than our preferred material, 'screenings'.
- Also, it can also have sharp glassy edges which can cut your liner!



6. Add the Soil

Geotextile fabric

First place this porous and non-degradable fabric over the screenings to prevent soil from seeping down into the reservoir

Soil

Use soil with a low clay content to prevent compaction and waterlogging. High-quality vegetable mix soil often fits the bill, as it promotes good drainage and aeration for healthy plant growth. There are some commercially available wicking bed potting mixes but these come with an increased price tag and aren't necessary.

7. Mulch Your Beds

When to mulch

Most important during spring, summer and autumn when the sun is most intense. Mulch helps protect the soil and also limits excess evaporation which can drain the reservoir faster. Mulch can also break down, feeding the soil life and in turn your vegetables

What type of mulch

Most will do the job perfectly well like, sugar cane, pea straw, and lucern. Avoid heavy and green mulches like arborist and council wood chips.





Choosing the Right Plants for Your Wicking Bed

Planting into your wicking bed is where the fun really starts and you can reap the rewards for your efforts. Over the years the team at Very Edible Gardens has seen plants of all types, shapes and sizes planted into wicking beds, some more successful than others and some being real eye-openers.



Annuals, perennials or trees?

Most vegetables are 'annuals' meaning they only live for one year or one season. And most of the food people grow at home are these annual veggies. Think everything from lettuce to beans to tomatoes and melons.

Annual veggies are are nutrient hungry, thirsty and high value crops, which makes them perfect for wicking beds! They allow you to cycle multiple crops per year ensuring you get the best 'bang for your buck' from this higher value growing space.

Perennials can and do thrive in wicking beds but will also do well in ground. Small perennials like sorrel, rhubarb, strawberries, and some other berries are all great additions, but it's best to avoid large woody rooted species for the reason mentioned next.

Trees and shrubs will grow great in a wicking bed but that comes at a cost. The deeper roots will soon make their way into the water reservoir and can damage the carefully curated layers, compromising the wicking bed functionality.

Planting seedlings

Start by planting seasonally-appropriate seedlings. Consider their sun and shade requirements, with taller crops generally on the south side and smaller ones on the north. To reduce reaching, plant the most frequently harvested plants closer to the edge. Because the layer with the most moisture can be fairly deep in a wicking bed, make sure you top water for the first couple of weeks until the roots find their way into the sweet spot below. Once they take off switch over to watering through the inlet pipe so that further root growth is encouraged to grow deeper.



VEG's Top 10 Plants to Grow in Your Wicking Bed

(with a Melbourne bias)

1. Tomatoes

The star of the summer garden, tomatoes love wicking beds!

2. Leafy greens

From lettuce to spinach to kale, the salad bar is open year-round with a wicking bed. The regulated moisture levels really help these garden must-haves thrive.

3. Herbs

Need fresh herbs for that pasta recipe? With a wicking bed, you'll have a smorgasbord of flavours at your fingertips. Basil, coriander, parsley, chives – the list goes on and on for the types of culinary herbs that will prosper in your wicking bed.!

4. Strawberries

Who can resist the lure of fresh strawberries on a warm summer day? Definitely not annuals but if you have smaller wicking pots or a dedicated bed Strawberries love the extra moisture and being raised up off the ground.

5. Capsicum/peppers

They're colourful, deliciously crunchy, and grow like champs in a wicking bed.

6. Eggplants/aubergines

Deep purple and versatile, eggplants take many dishes to that next level. They're a hungry and thirsty vegetable that loves to be pampered with the constant moisture off a wicking bed.

7. Zucchini/courgettes

Ever had more zucchini than you know what to do with? Prepare for a zucchini bonanza, because these prolific producers love wicking beds.

8. Beans

Green, purple, yellow – beans are a garden's beaded curtain. Easy to grow, fun to pick, beans are a wicking bed's best friend.

9. Cucumbers

A bonus feature of wicking beds is their raised design. This puts your vegetables at a comfortable height, making it easier to tend to your plants and reducing strain on your back.

10. Berries

Cane and bush berries! No not an annual but let's spice it up a bit! If you have multiple beds and can afford the space, raspberries and blueberries can do very well in a wicking bed.



From Our Garden to Yours: Final Thoughts

And there you have it! We hope you picked up a few of the insights, tricks, and trusty techniques that we've learnt on our long wicking bed building journey. Over the last 15 years we've had a lot of fun, sense of exploration, and pride at seeing so many hundreds of our gardens including wicking beds fill up with magnificent produce.

So whether it's rolling up your sleeves and diving head-first into a DIY project, to carefully selecting pre-made and professionally installed options, we want you to experience the joy of low maintenance garden as well. Sure, getting your hands dirty and nurturing your own little green haven is a blast. But it's also about building something that lasts. That's why we can't overstate the importance of using quality materials and sticking to a design that's been put through the wringer and proven to work time and time again.

Here's to a future full of luscious gardens, abundant harvests, and the joy of knowing that it all sprouted from your very own wicking bed.



Other Resources

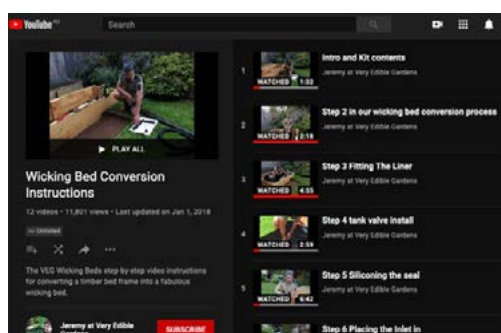
Videos

Introduction to Wicking Beds



Prefer a video introduction to wicking beds? This workshop recording goes through the VEG way of doing things, plus some of the alternatives we don't cover in this document.

Our online instructional videos



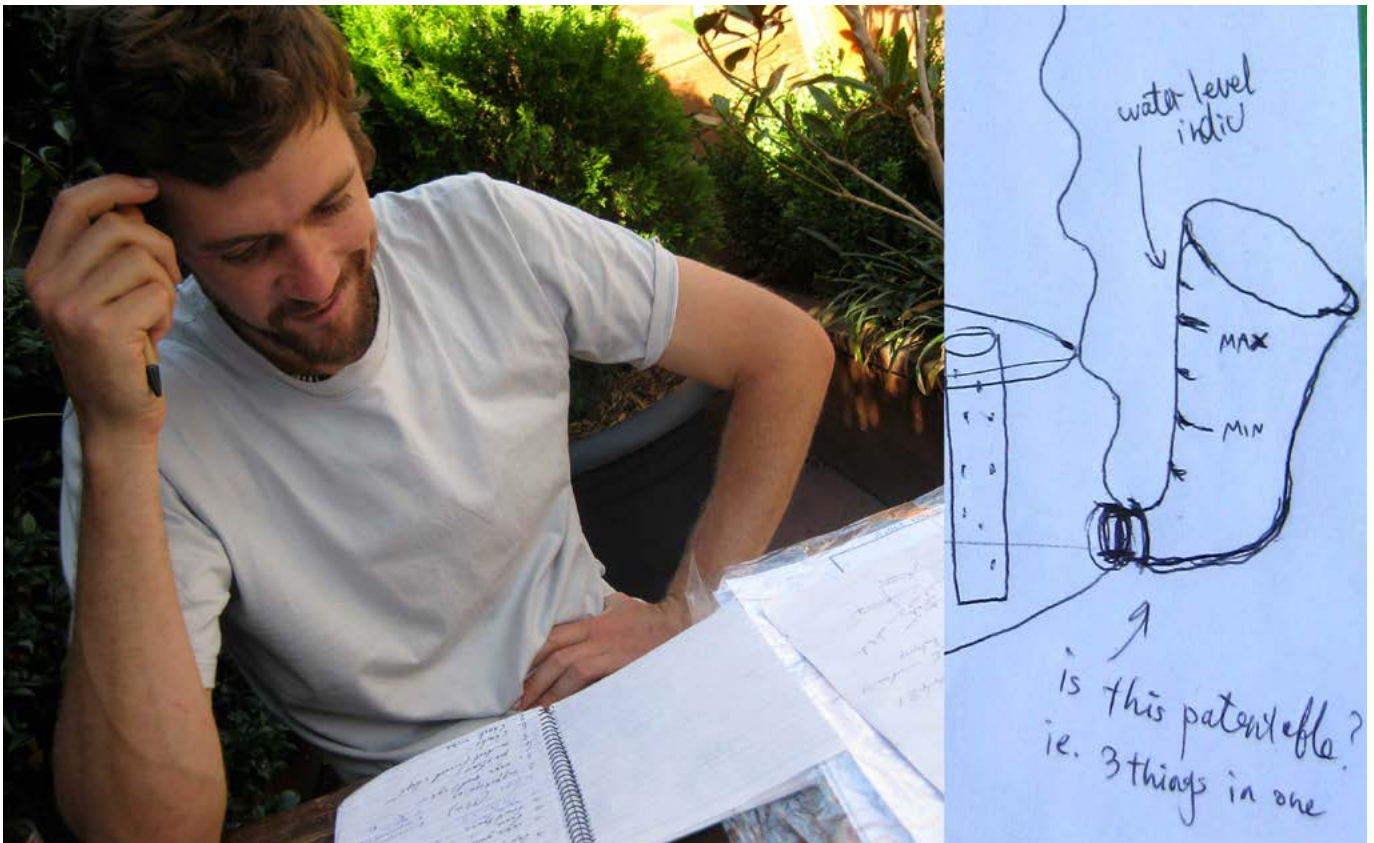
Step by step wicking bed conversion videos. These are designed for use along side our written instructions that come with our wicking bed kits, but any one can watch and learn from them!

In Memorandum

VEG founder and Director Dan Palmer 1974-2022

Very Edible Gardens (VEG) co-founder Dan Palmer passed away sadly in 2022, well before his time. He was a widely respected leader in permaculture and related fields around the world. A little known fact is that in 2009, over a beer with VEG co-founder Adam, he had the following idea for a simple bit of plumbing. This insight actually makes wicking beds way more functional than those that came before! A system we've talked about in these pages.

Despite the written note made on the day, we never did get around to patenting it! And lots of people locally soon began using the design. Dan was founder of the volunteer backyard makeover network permablitz, and shared his knowledge for free through his Making Permaculture Stronger podcast. He would have loved that on these pages we're sharing our 15 years of knowledge in building wicking beds, including the simple method he pioneered. We miss you Dan.



Next steps

Thanks for making it this far

If you're interested in our **wicking conversion kits** (available Australia wide), or our **timber kits**, or **wicking bed installation services** (available in greater Melbourne) get in touch at:

www.wickingbeds.com.au



Happy growing! From Team VEG

