Getting riparian planting right in the Waikato

Your step-by-step guide for successful riparian planting

Protecting our valuable water resource is important for dairying in New Zealand. It also benefits the community who use water for drinking and economic, recreational, aesthetic, ecological and cultural activities.

Riparian zones can be used to maintain and improve water quality. Once fenced and planted, they filter nutrients, sediment and bacteria that leave the land as runoff. Healthy riparian zones will improve the health of your waterway.

This practical "how to" guide for riparian management covers planting and maintaining riparian zones for a sustainable and profitable dairy farm. It includes advice from industry and regional council experts.

What are riparian zones?

Riparian zones are the strips of land beside drains, streams, rivers and lakes. They include areas on-farm where the soils are wettest, such as wetlands, springs or seeps, and gullies.

DairyNZ

How to successfully manage your riparian zones

Have a plan to succeed

Having a plan is the key to getting value for your money and doing it right the first time. Your riparian plan should cover the three steps of fencing, planting and maintaining your riparian zones.

Use your farm knowledge to form your plan

1. To avoid losing plants in floods, determine how your waterway behaves in full flow. This will help you decide where to place fences and what to plant.
2. Identify areas on your farm where runoff or erosion occur most frequently and have the greatest effect on water quality. This includes seeps, springs, gullies, eroding banks, boggy areas and wet soils. These should be part of the fenced area and prioritised for planting.
3. Decide what is manageable. Fencing can be completed reasonably quickly, whereas planting and follow-up maintenance takes longer. Set a realistic timeframe and budget for planting. For example, by planting 25% of the area per year, your riparian zones will be complete in four years.

TIP

Your Waikato Regional Council catchment management officer can answer questions you have about fencing and riparian margins. Call 0800 800 401 and ask for the catchment management officer that covers your area. It's the best way to find out what funding and support is available.

Set fences back from the regular high flow height. This may be quite different from the low flow height.

First things first – animals out

Livestock trample and graze plants. They also damage banks and defecate in water, adding sediment, nutrients and bacteria which reduce water quality. All waterway fencing needs to be permanent to guarantee stock exclusion.

Map your waterways and create a fencing plan. Work out fence lines and crossing points.

Choosing a fencing setback distance

The aim of the setback is to slow runoff enough to ensure as much bacteria, nutrients and sediment as possible are filtered out before they enter your waterway. A setback distance for a healthy riparian zone should vary on-farm to reflect different soil types, slopes, and flow.

A wider setback is needed on steeper paddocks, longer paddocks and heavier soils, because these all generate fast flowing runoff. On flat to undulating land, relatively small zones of 3-5 m are still capable of reducing nutrients, sediment and bacteria entering waterways.

When choosing the setback distance of your fence, keep in mind what you want to achieve by planting the zones. If you want to create shade for your stream to reduce weed growth and keep streams cool, you may need wider zones to allow more space for the trees. If you want to filter nutrients, sediment and bacteria from runoff, then smaller zones (3-5 m) with shrubs and grasses will still be effective.

TIP

You may require consent for certain types of fencing or planting. Check with Waikato Regional Council to see if you are within a flood control or land drainage scheme area before you start any work.

What to plant and where

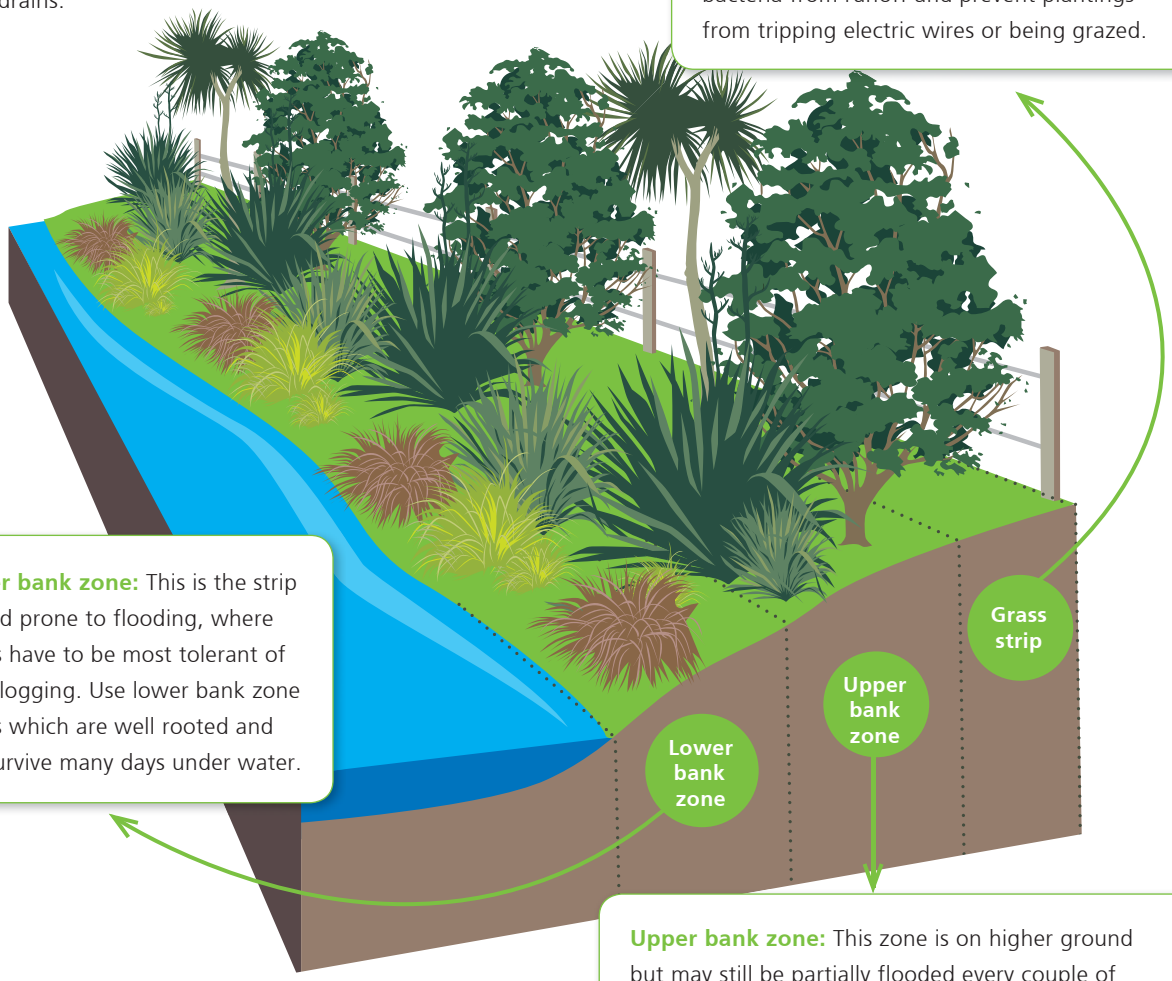
The next step is to decide what to plant, where and at what spacing.

There can be up to three zones of plant types on a healthy riparian zone, as illustrated in the picture below. Planting your upper and lower banks will improve your water quality more than using grass strips alone.

Use the Table of Riparian Plants in this guide to find out which plants are recommended for each zone in the Waikato region and the correct plant spacings to ensure plants outcompete weeds.

Drains: Maintaining access to drains is important so plant up one side only, preferably the north bank to provide the stream with shade in summer. Avoid planting deep-rooted species (upper bank plants) over tile drains.

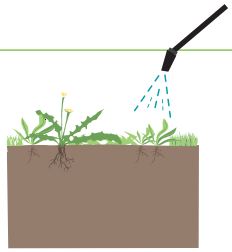
Grass strip: A one metre wide grass strip should be left around all fences. This will help to filter out sediment, phosphorus and faecal bacteria from runoff and prevent plantings from tripping electric wires or being grazed.



Lower bank zone: This is the strip of land prone to flooding, where plants have to be most tolerant of waterlogging. Use lower bank zone plants which are well rooted and can survive many days under water.

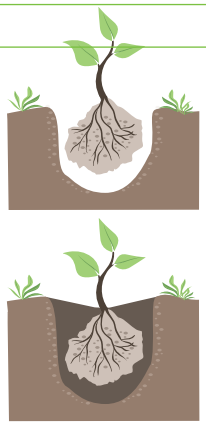
Upper bank zone: This zone is on higher ground but may still be partially flooded every couple of years. Use upper bank zone plants, which tend to be trees and shrubs to provide shade and shelter.

Steps for effective planting technique



1 Remove any grass or weeds.

- 4-6 weeks before planting, spray 1 m diameter circles with a glyphosate-based herbicide at the location where you will plant each plant. Check product information to ensure the herbicide does not remain active in the soil or have residual effects.

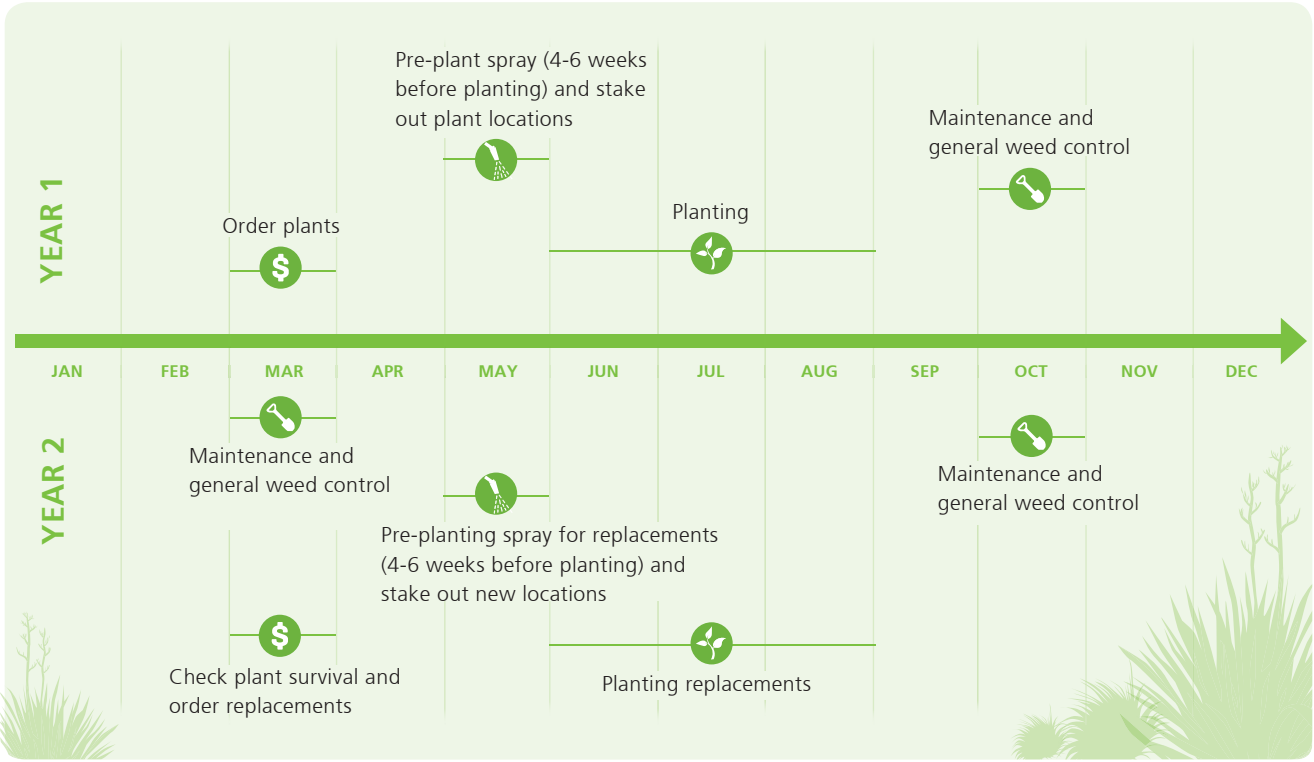


2 Put the plant in a hole that is big enough to accommodate plant roots without them being curled up or bent at the bottom or sides of the hole.

- On drier soils, ensure the base of the stem is 1-2 cm below the soil surface. Mulch around plants will help keep soils damp, reduce weeds and provide nutrients. Good mulches include straw, staked down cardboard, fine bark chips or wool.
- On permanently wet soils, place the base of the stem (just above where the roots start) about 2 cm above the soil surface with soil mounded up to the root ball.

3 Put a stake beside your plants so you can find them easily when you are weeding and can see if they have died or need replacing (don't attach the plant to the stake).

Riparian planting calendar – two year plan

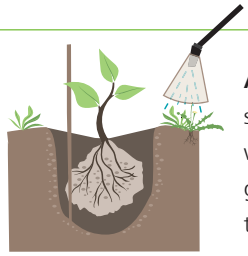


Holding the line: maintenance

Keeping on top of weeds and pests is crucial in the first five years for a healthy riparian zone to become established.

Combining protective and active maintenance methods is recommended as the most effective maintenance option.

Protective maintenance – this is less labour intensive but comes at a greater initial cost. Surround each plant with at least a 30-40 cm diameter of biodegradable mat that suppresses weed growth. You can use mulch, biodegradable weed mat (not plastic), or old woollen carpet. Wood chip or sawdust from the calf shed can be used as mulch as it has added nutrients from the manure. Avoid using plain wood chip around the plant as it will strip all the nitrogen out of the soil causing the plant to yellow off and possibly die.



Active maintenance - this can be labour intensive but has a lower initial cost. Each plant should be staked for easy location and brush cut, hand weeded, or carefully sprayed around with a glyphosate-based herbicide, twice a year. If you choose to spray, follow product guidelines; desired plants are usually highly sensitive to herbicides so extreme caution must be taken to protect against spray drift or accidental spray.

TIP

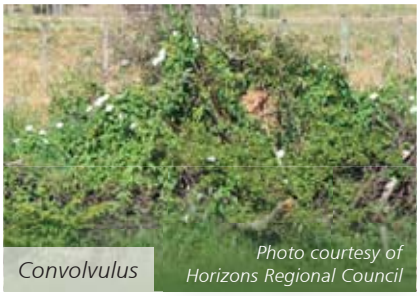
Grass strips do a great job at filtering runoff. Avoid the temptation to let livestock graze your margins, even if it is just rank grass. If you need to, brush cut your grass filter strips – don't spray them.

TIP

Pests such as rabbits, hares, possums and deer will eat your plants. Contact your Waikato Regional Council Biosecurity Officer for information regarding animal pest control by calling 0800 800 401.

Common weeds to remove in the Waikato

Blackberry



Convolvulus *Photo courtesy of Horizons Regional Council*

Gorse *Photo courtesy of Waikato Regional Council*

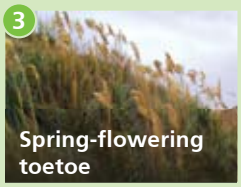
Tradescantia *Photo courtesy of weedbusters*

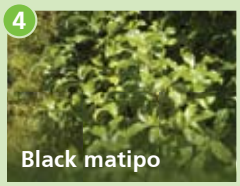
Barberry *Photo courtesy of Weedbusters*

Tutsan

Find out how to manage weeds in the *Controlling weeds in riparian margins* guide from Waikato Regional Council.

FAST 5 PLANTS FOR WAIKATO





These 5 go-to plants are ideal to start your planting with – they are hardy, fast-growing, can be planted straight into pasture and don't require shelter. Ask your nursery for Eco-sourced plants that are hardiest.

Table of Riparian Plants

Tolerates key: Full sun · Wind · Salt wind · Frost hardy · Poorly drained soil (boggy) · Dry soil conditions

Benefits key: Attracts birds · Attracts bees · Slope stabilisation · Filters runoff · Shade · Fish habitat

Plant name	Type	Tolerates	Benefits	Size (height x width)
Lower bank zone Space 1-1.5m between plants				
Cabbage tree (tī kōuka) *Cordyline australis*	Tree			10 x 3 m
Pukio *Carex secta*	Sedge			0.75 x 1 m
Spring-flowering toetoe (toetoe) *Austroderia fulvida*	Grass			1.5 x 1.5 m
Cutty grass (rautahi) *Carex geminata*	Sedge			0.75 x 1 m
Giant umbrella sedge (upokotangata) *Cyperus ustulatus*	Sedge			1 x 1 m
Swamp sedge (pūrei) *Carex virgata*	Sedge			0.75 x 1 m
Upper bank zone Space 1.5-2m between plants				
Black matipo (kōhūhū) *Pittosporum tenuifolium*	Small tree/tree			8x3 m
Mānuka *Leptospermum scoparium*	Small tree			4x1.5m
Akeake *Dodonaea viscosa*	Small tree			6 x 3 m
Broadleaf (kapuka) *Griselinia littoralis*	Tree			10 x 3 m
Kahikatea* *Dacrycarpus dacrydiodes*	Tree			40-60 x 4 m
Kānuka *Kunzea ericoides*	Tree			8 x 3 m
Karamū *Coprosma robusta*	Shrub/small tree			4 x 1.5 m
Koromiko *Hebe stricta*	Shrub			1.8 x 1 m
Lemonwood (tarata) *Pittosporum eugenoides*	Tree			9 x 4 m
Mahoe *Melicytus ramiflorus*	Tree			10 x 3 m
Mingimingi *Coprosma propinqua*	Shrub			4 x 1.5 m
Swamp flax (harakeke) *Phormium tenax*	Other			2 x 2 m
Tōtara* *Podocarpus totara*	Tree			20 x 4 m
Wineberry (makomako) *Aristotelia serrata*	Shrub/tree			8 x 3 m

*Plant these species into existing vegetation or 2-3 years after initial plantings so they have shelter to grow.

Successful riparian planting in the Waikato

Grant Wills milks 650 cows on a 215 ha (effective) property near Walton. The gently rolling land has been in Grant's family for three generations. Five kilometres of different stream branches run through their property and Grant has planted over 7700 trees in the last 10 years.

What have they done to manage their riparian zones?

Grant started fencing on a steep section of river bank which had stock management issues. It was retired and planted in Ovens Cyprus, a forestry crop. When the Clean Streams Accord was introduced in 2003, Grant saw real value in farmers fencing and planting waterways for farm management benefits and to help meet long-term international market needs.

Early on, Grant mapped his whole farm and the waterways were divided into bite-sized sections for planting. Fencing setbacks vary depending on the terrain and where it would be beneficial for stock management. Grant's attitude to setbacks has changed over time. "You don't really miss the grass and you are better off planting trees in unproductive areas. You get aesthetic benefits and improved stock management."

Over the last ten years he has planted all his waterways. By making planting a family activity, Grant says the process has been manageable. Their eldest son was in charge of pruning the first Ovens Cyprus crop and their second son and his friends got paid to plant other areas.

GRANT'S TIPS FOR RIPARIAN PLANTING

"Plants need to be fairly close together"

We have a maximum of two metres between plants. At this distance they can provide shelter for each other and prevent weeds from getting a good hold.

"Leaving a grass strip prevents the plants from short circuiting the fence"

If you have no young stock you can pull the lower wire up and stock will happily graze the grass under the fence.

"Fencing and planting are fairly easy, however follow-up maintenance is demanding, but it's essential"

Be realistic – get staff, family or casual workers on board and make a plan to keep on top of it as it makes a big difference. We plant in June/July and do maintenance in the following year which consists of trampling down grasses around the plants and spraying out any blackberry. You can't just do this when you get a chance, it has to be done at specific times of year and usually these are the busy times.

A valuable asset for your farm

When fenced and planted, riparian zones are a valuable asset for your dairy farm. They function like a sieve, helping to filter out sediment and nutrients that leave farmland in runoff before they enter waterways and provide valuable habitats for animals.

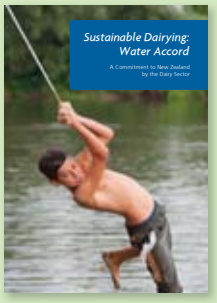
How do healthy riparian zones improve water quality?

- Riparian zones help to reduce sediment into waterways, improving water clarity and the habitat for insects and fish. Less sediment means less cost for drain clearing and less risk of flooding.
- Riparian zones reduce nutrients into waterways, decreasing weed growth, improving biodiversity and water quality, and providing a better environment for swimming and fishing for you and your community.

On your farm, well managed riparian zones will protect stock from getting stuck or drowning in waterways, provide more shade, reduce heat-stress and make it easier to manage stock.

Riparian plants stabilise banks with their roots, limiting the loss of your land through erosion.

The Sustainable Dairying: Water Accord (Water Accord) was developed in 2013 by the dairy industry and is a commitment to manage the land in a way that contributes to achieving water quality desired by New Zealanders. Good riparian management is a requirement of the Water Accord.



The Water Accord requires dairy farmers to ensure:

- Stock exclusion from 90% of farm waterways* and drains** greater than 1 m in width and deeper than 30 cm and significant wetlands by 31 May 2014 and 100% by 31 May 2017.
- 50% of dairy farms with waterways* have a riparian planting plan by 31 May 2016 and all by 31 May 2020.
- Of these farms half of their riparian plan committments have been met by 31 May 2020, with full implementation by 2030.

*A water accord waterway is a "lake, spring, river or stream (including streams that have been artificially straightened but excluding drains) that permanently contains water and any significant wetland. This does not include temporary watercourses that flow during or immediately following extreme weather events".

**A water accord drain is an artificially created channel designed to lower the water table and/or reduce surface flood risk and which has permanently flowing water but does not include any modified (e.g. straightened) natural watercourse.

Waikato Regional Council has rules about what can and cannot be done near or to waterways. Activities you may need consent for around riparian zones include:

- Construction of bridges, culverts, fords, tracks and raceways.
- Any activity disturbing the bed of a river or lake, including the removal or deposition of sediment.
- Clearing vegetation in, on or under the bed of a river or lake. This includes removing vegetation, rocks, gravel, sediment or other obstructions from a waterway.
- Drainage of a wetland or the creation or deepening of drains close to a wetland.
- Introducing or planting pest plants.

Variation 6: If you take surface water for dairy shed washdown and/or milk cooling (from a stream, spring, river, creek, drain) you will most likely need a riparian vegetation management plan as part of your water take consent. Contact Waikato Regional Council info@waikatoregion.govt.nz for more information.

Waikato
REGIONAL COUNCIL
Te Kaunihera ā Rohe o Waikato

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