

# SILT RECOVERY TASKFORCE

## Returning productivity to silt-impacted land

This infosheet is to guide landowners with silt on their property to return their land back to productivity using practical interventions which will support the soil formation process.

We know that a lot of fertile land around the country was formed by floods, and silt being deposited, and that productivity will return in time.

### Figuring out what kind of silt you have

This table outlines the difference between clay, silt, and sand to help you identify what type you have on your land, and what interventions will best work.

	HEAVY	MEDIUM	LIGHT
Texture	Clay loam to silty clay loam	Silt to silty sand	Sand
Feel when rubbed between fingers	Smooth / greasy. Hard to define particles and smears between fingers.	Slightly gritty, some particles observed, may smear lightly but notable rougher than heavy.	Gritty with large particles easily seen by eye.
Typical surface post flood	Flat or smooth	Ruffled	Rolling
Typical Limitations	Poorly drained, retains water for some time. Surface glistens post rain and typically turns to sludge. Limited aeration, but higher clay mineral fraction can be more nutrient rich.	Imperfect drainage, Subsurface remains moist but surface dries out rapidly. Surface layer becomes a crust and can also limit aeration due to saturated subsoils.	Water drains out rapidly, surface becomes windblown and no moisture in subsurface. Limited water holding capacity can constrain growth, and typically less nutrients present.

## Make a plan

Incorporating silt is generally cheaper than removal, and removal may not always be practical and have limited immediate financial return. We recommend landowners understanding the extent and nature of deposition, work out the best way forward, set a budget and make a realistic plan, noting full productivity may take up to five years to return. In some instances organic and inorganic material may have been deposited that would be better left. Where debris including fence posts, wire, and logs are present landowners need to consider the best cultivation method to avoid damaging machinery.

Your plan should consider:

- type of silt (depth, texture, odour, dampness) and potential use
- incorporating all silt where depth is <300mm using ripping and cultivation techniques
- incorporating using deep rip where silt is between 300mm and 500mm
- where deeper than 500mm, cultivating to aerate, then directly drilling. Quality can be augmented with side dressing fertiliser
- contour as needed to control surface flow, but limit earthworks as this will mitigate input costs.

## Typical Silt Nutrient Composition

- High pH (often 7-8)
- High Base saturation, often at 100% and dominated by Calcium
- Cation Exchange Capacity (CEC) low due to high saturation levels
- Very low organic matter as silt is mineral component of topsoil
- Low N, P, K nutrient levels

Nutrients are augmentable with Fertiliser, but consider cost versus output for your situation.

Soil Profile – sandy silt overlying original top-soil layer.

Silt could be incorporated via deep ripping to bring elite topsoil back into operation.



Sand deposition:  
Note, wavy surface and wind ripples.



Heavier clay deposition:  
Note smooth surface, wet and slimy



Example of differential deposition across topsoil– perfect for incorporation. Silt Layer is <20cm, blue/grey layer caused by lack of oxygen and both fine and coarse sand visible. A shallow rip and cultivation will aerate and address shallow deposition.



Example of grass & weed growth in silt-root depth becoming well established on its own without intervention. Approx 1 year post cyclone, no action taken. Note blue / grey layer showing aeration limitations from imperfect drainage



## Taking Action

### 1. Establish a Cover Crop

- Choose cheap and available seeds that can readily establish with lots of deep roots and thrive on site. Ideally you should plant a mix of plants to help soil health that are hardy, fast growing, and tolerant of a range of conditions.
- Consider using big seeds that will establish in challenging conditions. Examples of some seeds that may work are forage oats which can be cut for spring silage but needs re-sowing each season, cereal forages, perennial rye grass, and blue lupins which are edible for stock. If you are using legumes, inoculate where needed (i.e clover & soy beans) to ensure nodulation.
- Test your soil and add fertiliser in small amounts regularly to enhance growth but avoid large doses as compromised soil structure leads to high loss. Elemental Sulphur can be added to lower pH but weigh costs as breakdown of organic matter will achieve this in time.
- Talk to your contractor to gauge what will work with your budget and silt.

### 2. Monitor growth and manage moving forward

- Keep an eye on progress, irrigate and side dress if necessary to promote growth.
- A light graze can be beneficial for introducing animal manure, but beware of pugging damage from heavy stock.
- Allowing the seed to set can enhance root depth and extent as well as build a seed bank into the soil
- Beware of weeds and invasive species including gorse, blackberry, willow, and Chilean Needle Grass may have been mobilised with flood waters and sediment. Identify and remove unwanted species. Targeted herbicide applications are efficient in control.

## Pluck Test

Use a pluck test to determine if newly sown grass is ready for the first grazing.

### How to do a pluck test

Grasp ryegrass seedling firmly between the thumb and forefinger, then tug in a single, quick movement (to mimic a cow biting)



**Pass**  
if the leaves break off and the roots stay in the ground.



**Fail - if the roots come out.**

Source: <https://www.dairynz.co.nz/>

## Weeds and pest plants

The potential for mobilisation of pest plants with flood sediment, water and debris will require careful vigilance across the coming seasons. Hawke's Bay Regional Council Pest Hub ([hbrc.govt.nz](https://hbrc.govt.nz), search #pesthub) has on pest plant species and appropriate control measures. For additional advice on control, contact your Fruited, Horticulture, or Farmlands representative.



Chilean Needle Grass seedhead –  
HBRC Pest Hub

### Chilean Needle Grass

Chilean needle grass impacts productivity and animal welfare and while unpalatable to stock when seeding, the sharp seeds can penetrate skin and muscle leading to abscesses and blindness as well as causing downgraded meat, pelts and wool.



Tutu leaves and flowers –  
Jeremy R. Rolfe.

### Tutu

While tutu is native, it is considered New Zealand's most poisonous plant, causing cattle and sheep loss where it is consumed by animals. Tutin in honey can also cause poisoning in humans.



Nutgrass Seed head –  
Jeevan Jose

### Nut Grass

Nutgrass is a colony forming perennial (sedge) which produces an extensive underground network of fibrous roots, bulbs and rhizomes within the surficial 120mm of soil. It competes strongly against preferred pasture species and its roots release substances to harm other plants making it difficult to control.

## References and further resources:

Talk to your industry boards, advisors, consultants, and sales representatives to gauge what's working and use the information in this guide to tailor your plan. You can find more information and guidance here:

- [Landwise have curated a range of resources](#) to assist immediately Post cyclone including the findings of their Cyclone Gabrielle Baseline Sampling report.
- The Silt Recovery Taskforce has worked alongside the Insurance Council New Zealand And EQC to [compile a list of authorised contractors for removing silt or waste](#).
- Read the research and findings from the 2004 [Lower North Island Storm Event on cultivation and sowing results](#).
- The [Rural Support Trust](#) can offer a range of support and facilitation services.
- Hawke's Bay Regional Council has a range of [FAQs on dealing with waste](#).
- [Beef & Lamb NZ Flood Recovery Fact Sheets](#).
- [Dairy NZ advice](#) and [post-flood pasture renovation & Pasture Renewal Guide](#).