

## Tips From Farmers

### Post Cyclone Bola 1988, Manawatu 2004 and Wairoa/Hawkes Bay 2011 & 2018 weather events:

- Shade cloth is useful and easy to use for temporary fence repairs.
- Make use of offered help – even if it is to shake debris off fences.  
“PEP (now Taskforce Green) - they did a massive job with some of the more mundane/”dirty jobs”. If you are organized and take a personal interest (spend a bit of time working with them and having a sausage and beer with them on Friday afternoon) they can power through a lot of debris clearing of fences and the like ready for a fencing gang to follow through later”
- Combine with neighbours when using helicopter to improve efficiency – be organised to do multiple jobs (fencing and waterline materials, seeding, spraying, etc on several farms).
- Retrieving fencing material is easier before debris dries.
- Consider realistic long-term use of land before renewing fences on current line or oversowing slips. Badly affected areas may be better in trees long term than oversowing for pastoral use.
- Helicopter time may be better spent controlling thistles in late autumn than oversowing now.
- Make a list and prioritise (eg boundary and road fences vs internals)
- Build a team (utilise those like accountant, bank, contractor etc) and use their expertise in each area, this will lighten the load on you.
- Time heals – we have been through this before and come out stronger.
- Keep an eye on friends and neighbours – the quite ones, those not accepting help, not prioritising

## Silt Revegetation

### 1. Rules of thumb:

- **Shallow silt** (no pasture survival)

Where possible cultivate to mix silt with underlying better fertility soil and to break up any vegetation layer that can rot and produce toxins that limit seedling establishment.

- **Deep silt**

Oversowing damp silt can be effective with grass, coated legumes combined with Nitrogen & Phosphorus fertiliser. Use 1.5 x normal rate of fertiliser for the new grass.

If unable to oversow before surface dries, wait till can get on with machinery and cultivate.

Short term or perennial grass with legumes, or oats are good options.

NOTE: seed will rot if there is surface water

- **Patches of silt**

In otherwise surviving perennial pasture – direct drill or cultivate/sow/harrow perennial grass and clover and spell to establish

Direct drilling or cultivation will aerate soil and prevent toxins from underlying rotting grass affecting germination/root development)

## 2. Details:

- 1) Make an assessment of each silted paddock (spreadsheet format best):
- 2) Record silt depth (e.g. 0-5, 5-10, 10-20, >25cm),
- 3) Texture (sand silt or clay)
- 4) Density of pasture after 10 days
- 5) Is it smelly (indicates lack of oxygen/ production of toxins and need to aerate/cultivate).
- 6) Add in feed requirement estimates.
- 7) Use the info to determine urgency of action (eg deep wet clay sediment – will need time to drain), which species to use, timing etc.
- 8) Create plan of what, where, when and timelines for work. Also have a backup plan, for if you can't get contractors etc.

The more that is grown, the faster the organic matter builds up (increases water and nitrogen and sulphur holding capacity) and forms soil structure (improves drainage, resilience to treading and cultivation) and improve productivity.

There can be lots of differing depths and texture so best options vary.

See the decision tree file, developed after Manawatu floods in 2004.

The only caveat for the decision tree for **Gisborne/Wairoa** is that the fertiliser requirements are likely to vary in this district.

Most silt has very low Nitrogen, very low Phosphorus (often Olsen P < 6), adequate potassium (K), high Sulphur (S) for about a year, high Magnesium (Mg), very high pH (**DO NOT LIME**), minimal organic matter so limited N retention.

The silt may have low ability to store P (low P retention) – means high rates of P containing fertiliser may result in the Phosphate moving down through the silt/lost from rooting depth in deep silt (deeper than 0.5m).

The best product choice is usually DAP as it contains N and P, or 50/50 blend of DAP with ammonium sulphate e.g. CropMaster 20 that has higher N content, but limit rates (max 200kg/ha DAP, 300 kg/ha or Crop20 less per dressing) so don't risk losing P, or N.

For deep silt follow up with several higher than maintenance dressings over next few years rather than 1 large capital dressing.

Additional N applications may be needed to encourage growth where legumes are not included as silt N levels are very low.



- 1: Bola March 1988, silt over 1m deep
- 2: Bola debris removed and silt oversown. 16yrs later- very little fert
- 3: Bola silt cultivated and resown – no fert after cultivation – red clover clumps visible, grass pale from N deficiency
- 4: Bola silt (from photo 1) 16 years on - cultivated and resown + capital fert and nitrogen.

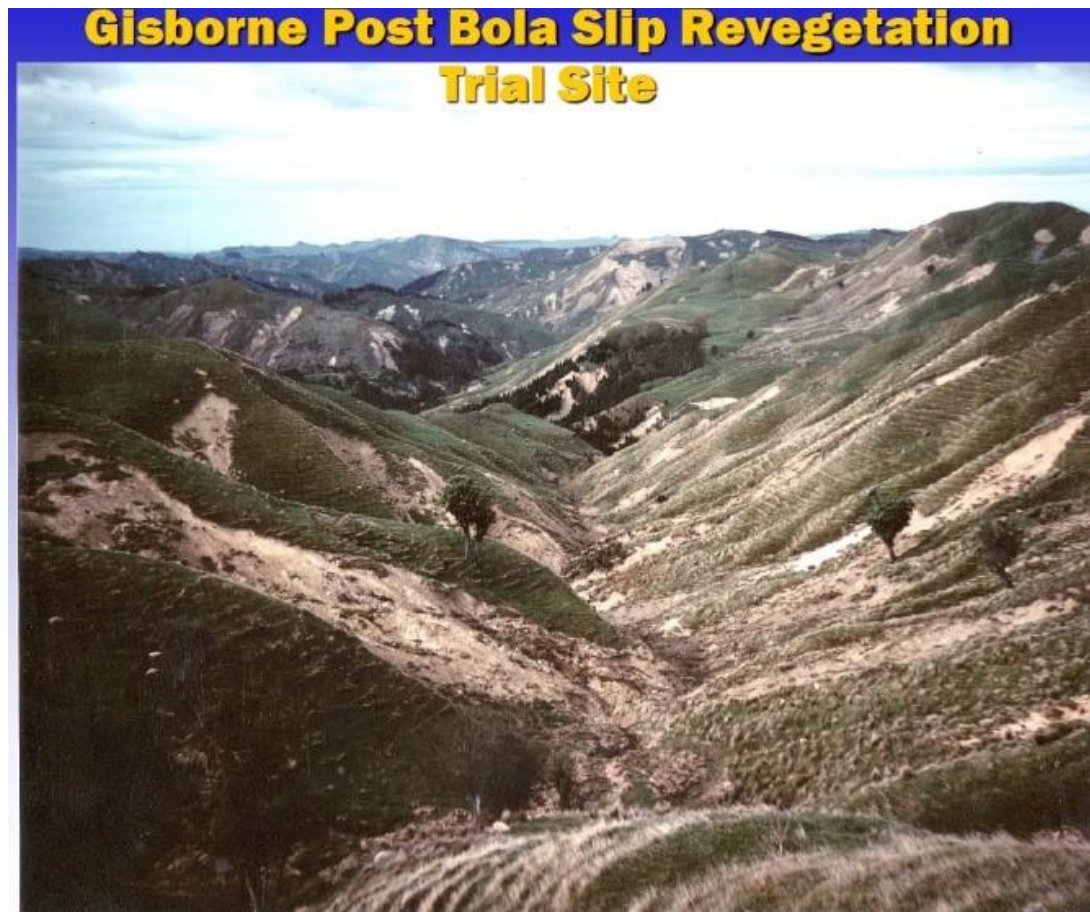
## Slip Revegetation

### 1. Is it worth it?

#### **Slip oversowing research conclusion:**

**Not recommended where similar spending could more reliably improve productivity elsewhere.**

- The slip tailings tend to revegetate themselves within 6 months and longterm can be up to 30% more productive than previous soil (accumulation of topsoil from above on top of original topsoil, and sometimes a gentler slope).
- To compensate for short term loss of feed, money is better spent applying nitrogen on better country, or controlling weeds (eg thistles).
- The slip faces are hostile places - after slipping, the soil is unstable and sown seed can wash off, there is low moisture holding capacity and little organic matter or nitrogen to sustain plant life.
- Trial results:
  - Initial oversowing 5 months post event on steepest part of slip face - seed washed off.
  - Results of oversowing of 12 month old slip faces – out of 7 grasses, 10 legumes and 3 herbs – some established, but only Red Clover and Lotus improved productivity 3 years later (to 70% production of surrounding unslipped pasture in a low stocking rate/low fertiliser input environment).
- **Cost of oversowing probably better spent improving productivity (fertiliser) elsewhere on farm or improving utilisation** (e.g. fencing. or controlling inevitable thistles in late autumn – where lots slips or historic thistle issues over big areas, thistle control may be cheapest by blanket spraying via plane especially if working with neighbours in similar situation).



Kiwiroa (Waerenga o Kuri) - 1<sup>st</sup> photo: after Bola in 1988, 2<sup>nd</sup> photo: neighboring ridge in 2004.

## 2. Details

**Slip revegetation Report from Dr Annette Litherland (AgResearch)** in 2004 summarising trial work and farmer experience from several slipping events in the North Island:

- Slips have 2 distinct areas: slip face (the steep scarp at top and the loose shallow subsoil exposed below), and the slip debris (tumbled mix of relocated soil and buried vegetation).
- Only the slip faces will have long term production losses as the tailings revegetate within 12 months. Tailings have a gentler slope than the original hillside that slipped, have a deeper topsoil depth (cos have soil from above) and higher organic matter than previously, so tend to have better moisture holding capacity and fertility, so can have up to 30% better productivity than previously.
- Slip faces repair slowly over time and are likely to reach 80% of unslipped production in about 15-20 years on mudstone or 40 years on sandstone.
- Slip to Tail ratio is determined by soil type not (slope or rainfall)
- Mud and siltstone - 20-25% of slip is faces.
- Sandy siltstone and sandstone - 35 to 40% of slip is faces.
- Slips tend to be on the steeper slopes which produce about ~25% less per ha with ~8% lower utilisation than gentler slopes.
- Therefore, loss to future farm production won't be quite as high as the proportion of farm with slip faces.

Oversowing can improve slip productivity but not necessarily cost effective. However, economics may not be the only consideration. The most important factors for successful intervention were:

- Be aware that oversowing may be unsuccessful on slip faces due to harsh and unstable conditions.
- Use a mix of coated legumes – small leafed white clover (~3-6kg/ha) and grazing type red clover (~5kg/ha) and Lotus if can get it/not too expensive.
- Over 10 years, natural production likely to be gradually improve to 40-50% of previous production.
- Could budget on oversowing achieving 50% better production than if did nothing (~1500kgDM/ha/yr increase if successful). i.e. increase production to 2/3rds of uneroded.
- Coated seed will have better ballistics (spread) for aerial sowing and can include rhizobia to help legumes establish.
- Timing – need conditions to be moist enough for germination and establishment, and warm enough for clover to establish (i.e. before late May, or in early spring in summer moist areas). Be aware rainfall events after sowing may wash seed/seedlings away.
- Fertiliser – slip soil is usually Olsen P 6 or less (fertility is in the topsoil), and little sulphur so Phosphorus & Sulphur fertiliser inputs likely to benefit production (by about 600kgDM/ha/yr).
- Most slips will expose sedimentary subsoil rather than raw pumice, so potassium (K) is usually adequate. Fertiliser also makes a good carrier for seed from aircraft.
- Don't include Nitrogen.

- Spell from grazing to allow establishment – so oversowing slips across large part of farm at one time not ideal.
- Could do part in autumn, part in early spring or spread over a couple of years - which would also spread the failure risk.



**Impact of slip age on pasture production**

