

Revegetating Cropping Soils after a Flood

Big Picture

- Each situation is unique but principles apply.
- Take time to breathe – plan, prepare, act for best results.
- Have broader changes affected viability of any parts as productive areas?
- Have drainage patterns changed, and is drainage effective?
- Access and conditions will influence order of treatment, actions that can be taken, and equipment that can be used.
- Think outside the box if needed.

Assess sediment

- The starting point for planning and action is assessment of the sediment.
- Flood sediment is typically unstructured, with varying depths, textures and fertility.
- Check texture, moisture, depth, nutrient status, and pH.
- Sediment is sandier where water was moving faster, siltier as it slows, clay where water ponds.
- Sediment will vary across paddocks, so consider different management zones.
- Can you viably spread sediment evenly across a paddock to make it uniform?
- Soil drying rate depends largely on texture – plan around that for drilling drier first, wet last.
- Anaerobic soil is not good for seed, but cultivation will rapidly help.

Actions

- Get something going as soon as sensible to avoid dry soil blowing and to start rebuilding soil structure.
- Oversow medium heavy sediments before they dry and bake – i.e. when water has drained but surface is still sloppy.
- Light sediments can and should be cultivated as soon as the flood water has receded. Cultivation should aim to bring some old topsoil up and mix it with sediment.
- Apply nutrients as indicated by testing.
- Plant at least a grass and a legume.

More information at <https://www.landwise.org.nz/projects/soil-repair-after-cyclone-gabrielle/>

Research

Studies of revegetating flood deposits followed events in 1948 and 1950 in Gisborne¹, and 2004 in the southern North Island². They focused on best management for pasture re-establishment, but the lessons apply generally.

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¹ McKee, J.G. and Graham, G.J. 1952 Pasture Establishment on Flooded Areas of Gisborne Flats. NZ Journal of Ag 84 (3) p197

² Wilson, M.D. and Valentine, I. 2005. Regrassing flood damaged pastures. Proc. NZ Grasslands Assoc. 67 p 117

The trials found the *texture* of sediment and the *condition of the surface* at the time of sowing covers most influenced successful pasture establishment. *Sediment depth and wetness* influenced best management actions.

	HEAVY SEDIMENT	MEDIUM SEDIMENT	LIGHT SEDIMENT
TEXTURE	Clay loam to silty clay loam	Silt to silty sand	Sand
SURFACE RELIEF	Flat or smooth	Ruffled	Rolling
FEEL	Smooth or greasy	Slightly gritty	Gritty
SPEED OF DRYING	Retains water for some time. Surface glistens	Subsurface remains moist. Surface dries out rapidly	Water drains out very rapidly
WHERE USUALLY FOUND	Ponding areas	Fairly close to river	Adjacent to river

Table 1. Sediment classification from McKee and Graham 1952

Light sediments

- can and should be cultivated as soon as the flood water has receded. This will also allow for re-levelling paddocks as required.
- Drill seed quickly to get establishment before the sediment dries out. Oversowing is not effective as light sediments dry out too rapidly.
- Cultivation should aim to bring some old topsoil up and mix it with sediment.

Medium and heavy sediments

- cannot be cultivated for a considerable time.
- A good seed strike should be possible without cultivation provided it is sown before the surface dries out and loses its stickiness.
- Oversow when water has drained but the surface is still sloppy, perhaps use helicopter or drone.
- If the surface dries, wait until cultivation is possible and then sow a cover crop.

Sediment depth

- Little or no sediment deposits were successfully managed by mulching surface organic matter and light cultivation to break any surface sealing.
- Medium sediment deposits should be mixed with the old topsoil if possible.
- Deep deposits need to be developed into a new soil profile.

Cultivation

Full cultivation and application of nitrogen made pasture establishment more reliable.

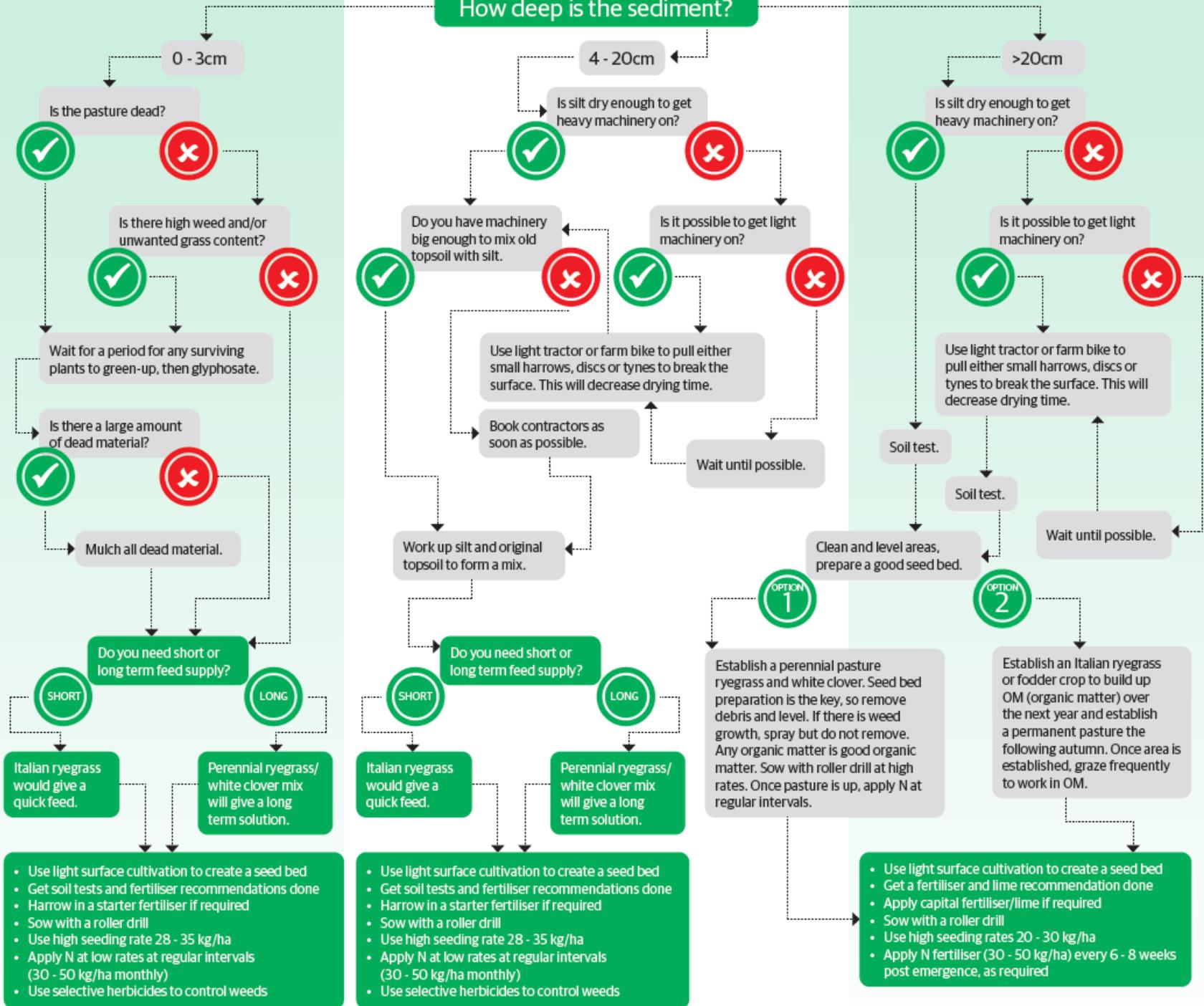
- Light cultivation when accessible helps heavier soil dry out
- Use lightest equipment as soil is weak
- Use of a roller drill was essential to establish legumes
- Weed management will be required, perennial weeds especially surviving flooding

Fertility and biology

Sediment fertility, organic matter content, and biological activity are usually low and pH is normally quite different

- Soil testing is valuable
- Apply amendments such as lime, acidifying products, fertilisers and bioactives as required
- Aim to grow a mixed cover with grass and a legume, and other species depending on future intentions
- Deep rooted species may help break any sealing between the sediment and old topsoil.

Guide to re-grassing flood damaged pastures



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