Fact Sheet

Pasture Recovery after a coastal flood

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Key points:

- Pasture species vary in their ability to survive a flood. Many pasture species that are common in our flood-prone areas can withstand inundation for a few days during autumn.
- Pasture survival after being submerged (or even waterlogged) is linked to how deep the water was and how long they were submerged for. Pasture submerged for more than 4 days is likely to die off and re-establishment will occur through the seed bank in the soil. In autumn, this means pastures that are re-establishing from seed will not have a lot of bulk, or ability to be heavily stocked over winter.
- Hot temperatures whilst inundated or waterlogged increases the risk and rate of pasture death.
- Heavy silt deposits over plants will reduce the rate of recovery.
- Pastures that were in good condition before flooding will likely recover well.
- Wait at least 2 to 3 weeks to see how pastures recover before jumping in to re-sow.
- Rest pastures showing good signs of recovery to allow new shoots to grow, replenish plant root reserves, and seedlings to establish.
- Over sowing with winter forage options is a good way to address potential feed shortages but does put more pressure on any surviving and recovering tropical grasses within that paddock. However it will reduce grazing pressure on other recovering tropical grass areas.
- If large areas of pasture have been killed, concentrate stock by sacrifice areas for hand feeding. This will ensure animal requirements are met and pastures that are recovering get a chance to grow without repeated leaf removal, or damage by cattle trying to graze.

Flood damage to pastures:

Damage to pastures can range from minor sediment deposition, through to deep sedimentation of silt, sand or gravel deposits on pastures, erosion of topsoil, scalding and total loss of existing pasture.

From a pasture point of view, the faster water moved over the farm (provided it has not eroded soil, or deposited excessive silt or gravel across paddocks) the better the pasture recovery potential.

It can take 2 to 3 weeks after a flood to be able to accurately assess how many of the desired plant species have survived or are geminating from the soil seed bank. For some, this simply involves making a visual assessment, but it may require a count of desired plants still alive per square metre for others. If there are 5 or more plants alive or germinating per square meter, with good care, these paddocks are likely to recover without being replanted provided they are not over stocked through winter.

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Pasture recovery:

Coastal pasture species that are common in flood prone areas (setaria, purple pigeon grass paspalum, couch, carpet grass and bahia grass) are generally resilient and will recover from flooding eventually. The challenging part about an autumn flood is that it occurs toward the end of the growing season (for these tropical/summer active species), therefore you will need to reconsider the carrying capacity of these pastures through winter. Kikuyu and rhodes grass are also common in some flood plain areas, both these grasses have a low to medium tolerance to flooding and their survival will depend on how healthy they were prior to the flood and the extent of the flood (water depth and duration of inundation).

Pastures that were in good condition prior to flooding and that were not completely submerged are likely to recover quickly. The adult plant will provide most of the bulk, so long as they have not collapsed down under the water level and are not covered in too much silt. A healthy pasture paddock is also likely to have a high soil seed bank, which once germinated, will assist in filling in any gaps.

Pastures that were completely inundated in deep water for more than 3 days, and/or experience high temperatures whilst still waterlogged, will be more reliant on the soil seed bank for recovery. Taller grasses are likely to have fallen over under the water, and if heavily silt covered, they will form a 'mat' at ground level. It is unlikely that many adult plants will survive this, those that do will be very weak for several weeks. This 'mat' of decaying vegetation can often smother any germinating seedlings.

Photo 1 (top) A healthy setaria pasture flooded for 3 days in the Lismore 2017 floods. Many adult plants did survive with careful light grazing through winter. Photo 2 (bottom) The same paddock recovered in late October 2017.

Management options:

Pasture and stock management to speed recovery will vary depending on the degree of flood damage, the percentage of the property affected and individual property circumstances.

The main options for encouraging pasture recovery are:

1. Resting paddocks

For pastures to recover they need to regrow leaves, and in some cases allow seedlings to establish. Often the first step is to reduce grazing pressure/remove stock. Stock will chase green material and constantly take new shoots, in preference to silt covered older vegetation. Cattle can cause significant damage bogging up the ground due to their weight. A few things to consider:

- Moving stock to another property or agistment. There are large areas of agistment available, speak with your agent, or explore websites such as http://agistment.net.au/, consider all the usual aspects of agistment in making this decision, distance, cost, yards, water, health issues etc.
- Sell some stock
- Set up a sacrifice area/paddock and hand feed to allow the majority of the flood affected pasture to recover. It can become very costly to feed a breeding unit through winter. Consider your finances and determine how long to carry stock and/or when to sell.

2. Silt Removal

Silt covered pastures often need additional rain fall to wash the silt off. This is because silt forms a physical barrier that prevents plants from photosynthesising to produce energy for growth. 15 to 20mm rainfall is often sufficient.

In paddocks where tall pastures have collapsed, under water and silt, a light topping with a slasher or mulcher can be of benefit (to remove the bulk of the silt covered layer). Take care not to cut too low, near the growing points, as this will add more stress to already weak pastures. The more disturbed or bare ground exposed, the greater the chance of weed invasion.

3. Control weeds

Weeds are common after floods, due to reduced competition from the pasture. Some weeds can severely compete with recovering pasture plants, and establishing seedlings, others can be toxic to livestock. If you don't know what something is seek advice. Control will depend on the weed species causing problems, it may be as simple as a crash grazing or topping, or it may require a herbicide treatment.

4. Replanting tropical grasses

Tropical pasture species planted at this time of year should be considered more of a renovation option and not likely to provide any significant winter feed for this year. Treat these as an option for paddocks you feel have a low population of desirable species, and you were considering renovating anyway, with no real need for feed until next summer.

Autumn Sowing options for winter feed:

If there is a possible upside to the timing of this flood, it is that on the north coast, autumn is an ideal time for sowing temperate forages so follow normal autumn sowing guidelines in terms of species and seeding rates. Try to minimise soil disturbance as much as possible to reduce weed burden, broadcast or direct drill is ideal.

Soft, wet ground will present challenges for some in using traditional seeding equipment so consider broadcasting seed with suitable machinery, especially if there is still soft mud/ silt present and no crust has formed on the surface. Seed to soil contact is still important. Broadcasting seed into a collapsed tussocky species, such as dead setaria, is not likely to be successful as seed will be held up in the tussocks or dead mat material (and will not be touching the soil). Consider mulching prior to seed distribution.

Ryegrass, forage cereals, chicory and forage brassicas, can all be planted as soon as paddocks are trafficable and will provide the best opportunity for winter feed. These species can provide good grazing in 4 to 6 weeks, from emergence, oats are likely to be faster than ryegrass to the first grazing, but ryegrass will provide more grazing events during the winter/spring. Forage brassicas will provide very quick feed and can be over-sown with ryegrass after the first grazing. With ryegrass, the larger seeded tetraploid types will produce feed faster than long season types. Long-season varieties can be slower to produce feed but may last longer into the spring (with irrigation), consider the price difference, especially beef producers who may need to plant large areas.

Planting can commence as soon as there is no water lying on the ground, and only if stock can be removed for at least six to eight weeks to allow these species to germinate & grow. Forage brassicas, ryegrass, and clover can be established by broadcasting. Chicory does not like waterlogging and establishes best with good seed to soil contact e.g. direct drilling.

Forage cereals have a larger seed and are less suited to broadcasting and prefer being drilled and are more susceptible to water logging than ryegrass. If the season looks to be dry, however, or irrigation is unavailable during a dry season, forage cereals will outperform ryegrass as they have a higher water use efficiency (more dry matter produced per mm of water).

When broadcasting any seed, increase planting rates for most species to about 20% above direct drilled rates.

Waterlogged soils affect the availability of nitrogen, sulphur and phosphorus. Very wet soils can be planted with seed only, and then fertiliser applied once the soil dries out further and young seedlings have emerged. Ideally within 2 – 4 weeks after emergence.

Photo 3 (top left): A dead setaria, paspalum and couch pasture following the 2017 Lismore floods. Paddock was drilled with a mixture of oats and ryegrass 3 weeks post flood with disk drill to cut through the trash and place seed into soil. Photo 4 (bottom left) shows same paddock 2 weeks post emergence (5 weeks from flood).

Need more information?

Fact Sheets for download

Establishing Ryegrass in the subtropics
Managing Ryegrass in the subtropics
Establishing Chicory & Ryegrass on the North Coast
Establishing Kikuyu Pastures
Forage Brassicas for autumn-winter

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Photo 5, shows the same paddock during the first grazing (9 weeks after the flood), note the unplanted paddock to the right slowly recovering but with minimal feed available.