

Adapting revegetation to a hotter and drier climate: Lessons from the drought.

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The drought of 2018/2019 was considered the worst in recorded history for the New England Tablelands. At the time, it seemed many plantings, including long-established ones, had died. Fortunately, in-part due to the good rainfall that followed the drought, most revegetation sites recovered well.

The region is expected to experience similar hot and dry conditions under predicted climate change scenarios.

Armidale Tree Group interviewed 30 experienced revegetation experts in the region and captured their insights from the drought, regarding maximising revegetation success in future droughts. Presented here is a summary of outcomes from these interviews.

A clear message from this project is that **current recommendations for revegetation, when done well, lead to very successful revegetation**, even under predicted hotter and drier conditions. These are:

- Rip the soil to >450mm deep, at least 6 months before planting to build subsoil moisture.
- Keep weeds and competing grasses at least 50 cm away from planting lines and planted seedlings at least 6 months before and 12 months after planting.

- Ensure seedlings are planted with the rootball 25 mm below the surface and in firm contact with surrounding soil and water seedlings in well after planting.
- Use sufficiently wide spacings between rows and between plants.
- Aim to plant in autumn as this is now likely to be a more reliable time to plant than spring.

Most tree and shrub **species** that are currently used in plantings are surviving well, with the exception (in some situations) of Snow Gums (*Eucalyptus pauciflora*) and *Banksia integrifolia*. Species from higher rainfall areas have struggled in recent years and should be avoided. These species include Shining Gum (*Eucalyptus nitens*), Sydney Blue Gum (*E. saligna*) and Eurabbie (*E. bicostata*).

More species that are found in the western region of the Tablelands could be added to plantings to increase diversity and climate resilience. Obvious contenders include Kurrajongs, Cypress Pines and *E. bridgesiana*, *E. albens*, *E. moluccana* and *E. sideroxylon*. More Casuarinas in plantings would increase climate resilience with these trees also providing a range of biodiversity values.

While the **genetics** of species currently used in Tableland plantings are generally doing well, future seeds should be sourced from areas along a gradient from the current climate to areas likely to approximate future climate conditions. This ‘climate-adjusted’ seed sourcing strategy will improve the likelihood of including genetics in revegetation projects to better adapt to future challenging conditions. Increasing the number of plants (and locations) that seeds are collected from for each species will also increase genetic diversity.

Ensuring **fencing** is adequate to protect your investment in revegetation may become even more critical in dry and hot conditions as hungry native herbivores can place additional pressure on already stressed plants in revegetation areas.

Major **natural regeneration** events commonly follow drought, especially where good and prolonged rainfall occurs in following years. The abundant

regeneration is due to ample bare ground providing good conditions for seedling germination and reduced stocking rates. Eucalypts are the most conspicuous element of this natural regeneration, but other species have also germinated. To facilitate diversity, it may be necessary to exclude stock for long enough to allow a range of understorey species to grow to maturity, or to do in-fill plantings into these areas to encourage greater diversity.

Wildfires have not been a regular threat for the Tablelands previously. However, the Black Summer fires of 2019/20 highlighted that this could be an emerging threat and management strategies such as controlled burning, managing biomass with grazing and the use of less flammable species should be used in certain areas.

More detailed guidelines for revegetation that incorporate these lessons, and a podcast, can be found on the ATG website (www.armidaletreegroup.org.au).



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