

Herbicide Impact on Mangroves



Herbicides implicated in widespread dieback event

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New evidence shows that herbicide contamination is common in marine sediments along the Queensland coast. It has been suggested that widespread dieback of one mangrove species, *Avicennia marina*, in the Mackay region, could be due to herbicide pollution. This project investigated this observation, by determining how different mangrove species respond to three common herbicides; diuron, atrazine and ametryn (used for pre-and post-emergent applications). This was done using four concentrations of the herbicides to help determine the concentrations at which mangroves might be affected.

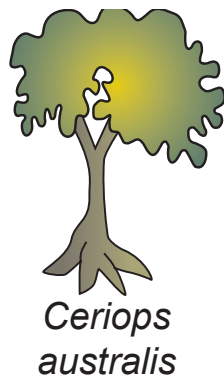
Mangrove Species Tested



Avicennia marina



Aegiceras corniculatum



Ceriops australis



Rhizophora stylosa

Salt-secreters

Salt-excluders

Some mangroves secrete salt from glands on their leaves while others exclude most salt at the roots. Mangroves which secrete salt may take up other compounds such as herbicides, along with the salt, in greater quantities than salt-excluding species. Salt-secreters include *Avicennia marina* and *Aegiceras corniculatum*, while salt-excluders include *Ceriops australis* and *Rhizophora stylosa*.

Methods

Mangroves were dosed with each concentration of herbicide once. Measurements were taken of plant height, leaf number, plant health (chlorophyll samples taken weekly, and measurements of photosynthetic efficiency). Sediment and leaf samples are being analysed for actual herbicide dosage concentrations.

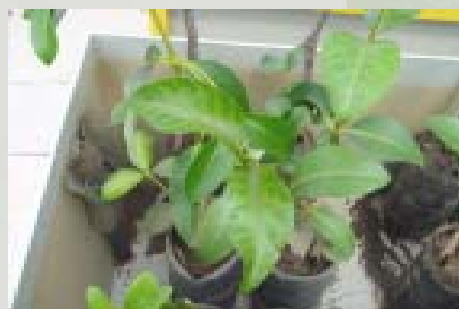


Taking plant health measurements

Tidal tanks with mangroves in Casa Manglar



Outcomes



Avicennia marina showing symptoms of herbicide injury (yellowing along the veins)

In the trials, all herbicides were more damaging to salt-secreting mangrove species than salt-excluding species. A dosage concentration of 4mg kg^{-1} of herbicide in the sediment notably affected *Avicennia marina*, while *Aegiceras corniculatum* was affected by ametryn and diuron treatments only. These results suggest that species-specific mangrove dieback in the Mackay region may be caused by herbicides. Determining if and how pollutants affect mangroves will provide useful information which will help reduce land-based impacts on marine environments.

