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Abstract

New Technologies for Weed Eradication—Invasive Plants Have No Place to Hide When DNA Is Involved †

Laura Simmons [1,2,*], Joe Vitelli [1] and Steve Csurhes [1]

[1] Biosecurity Queensland, Department of Agriculture and Fisheries, Dutton Park, 4001, Brisbane, Australia
[2] Queensland Herbarium, Department of Environment and Science, Toowong, 4066, Brisbane, Australia; laura.simmons@des.qld.gov.au (L.S.); joseph.vitelli@daf.qld.gov.au (J.V.); steve.csurhes@daf.qld.gov.au (S.C.)
* Correspondence: laura.simmons@des.qld.gov.au
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Building on the advances in molecular technology, two genetic based tools are being developed by Biosecurity Queensland to improve conventional invasive plant detection, monitoring and control. *Sporobolus* is a genus of almost 200 grass species from tropical and subtropical parts of the world. In Australia, 19 *Sporobolus* species are endemic and 8 species are introduced. Of these, 10 (5 natives and 5 introduced) are closely allied species and overlapping morphological traits makes accurate identification very difficult. Five of the introduced weedy *Sporobolus* grasses including Giant Rat's Tail Grass (GRT), threaten to cost the grazing industry of eastern Australia $60 million per annum, having the potential to infest 60% of Queensland and 30% of Australia. The success of four GRT biological control programs in Australia, hinge on the accurate identification of the host plant. The GRT project relies on a molecular approach to delimit and accurately identify these *Sporobolus* species, allowing for a more accurate and targeted control strategy to be used in the paddock.

The second molecular project focuses on the dioecious Mexican bean tree (*Cecropia* spp.), a restricted pioneer tree that has invaded rainforests in tropical and subtropical Queensland. Molecular markers are being used to genotype an eradicated population to identify if there are any undetected parent trees within surveyed areas that may be residing in inaccessible rainforest patches, thereby preventing extirpation to occur. Dust monitoring devices to capture pollen are being trialed as an eDNA surveillance method for detecting unknown Mexican bean tree populations in remote rainforest locations.