

## **Project 3.1.5** Ecotoxicology of pesticides on the Great Barrier Reef for guideline development and risk assessments

### **Project Summary**

Over 50 land-sourced pesticides (herbicides, insecticides and fungicides) have been detected in waters of the Great Barrier Reef (GBR) and its catchments. Previous studies on the risks posed to the GBR and its catchments by pesticides have focused on five priority PSII herbicides that have been frequently detected over the last two decades. However, other pesticides are increasingly being used, for which there are few fate, persistence and toxicity data. In order to improve water quality guidelines and assessments of the potential risks posed by these “alternate” pesticides to GBR and its catchments we will quantify their toxicity to relevant tropical freshwater and marine species.

#### **Problem**

- The management of land-sourced pesticide contamination in the GBR and its catchments is a priority for achieving targets intended to improve water quality and halt the decline of the GBR.
- Recent desktop assessments suggest at least some of the recently detected alternate pesticides pose similar (if not greater) environmental risks than more commonly applied chemicals.
- In order to effectively manage potential risks posed by alternate pesticides to tropical freshwater and marine ecosystems, we need improved knowledge of the ecotoxicity of alternate pesticides to relevant freshwater and marine species.

#### **How Research Addresses Problem**

- The toxicity tests will be performed in controlled aquarium facilities (including The National Sea Simulator at AIMS in Townsville and ecotoxicology laboratories at JCU in Townsville and AIMS in Darwin).
- All tests will accord with new criteria for deriving water quality guidelines, allowing them to directly feed into development of: (i) National, (ii) State and (iii) GBR ecosystem protection guidelines.
- The data will also be available to contribute to the revision of metrics for pesticide monitoring and reporting for: (i) QLD Regional Report Cards; (ii) Reef Plan 2013; (iii) Great Barrier Reef Report Card; (iv) Reef 2050 Long Term Sustainability Plan (LTSP); (v) regional Water Quality Improvement Plans (WQIP); (vi) chemical risk assessments for pesticide registration and review (e.g. the Department of the Environment and Energy conducts for the APVMA; (vii) relative risk assessments for alternate pesticides (for on-ground decision making by industries) and (viii) ecological risk assessments including the Scientific Consensus Statement.



*Preparing seagrass for herbicide toxicity tests*

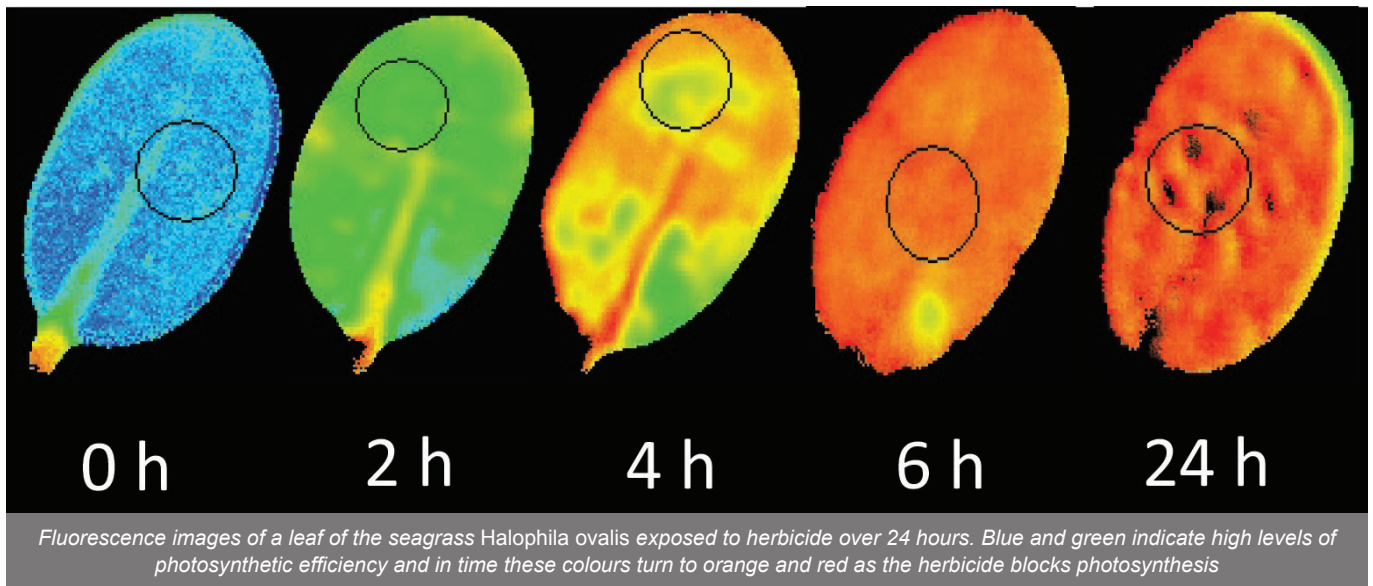


Photo: AIMS and JCU

## Value

The risks posed by alternate pesticides to the GBR and its catchments are uncertain. This research will provide primary data to ensure changes in pesticide usage patterns (due to management and policy decisions) are better assessed and ultimately contribute to reducing the pesticide pressures on sensitive freshwater and marine habitats.

## Specific management or policy outcomes

The Reef Water Quality Protection Plan 2013 (Reef Plan), the 2050 LTSP and State Water Quality Improvement Plans have set targets for reducing the potential contribution of pesticides to the decline of coastal water quality of the GBR.

Ecotoxicology data from this project will:-

- Ensure future guidelines are relevant to, and protective of, tropical freshwater and marine ecosystems;
- Strengthen the Reef Plan pesticide targets and updated reporting metrics for a wider range of pesticides;
- Help identify whether alternate pesticides are safer options as replacement chemicals;
- Help develop targeted monitoring and management plans for alternate pesticides;
- Inform updates to the environmental risk assessment guidance for agricultural and veterinary medicines, as well as guidance and awareness for assessors in relation to the Environment Protection and Biodiversity Conservation Act and to protect Matters of National Environmental Significance such as the Great Barrier Reef and Ramsar wetlands.

## Further information

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