

A four-tiered approach to integrated pest management (IPM) for crown-of-thorns starfish (COTS)

The Reef and Rainforest Research Centre (RRRC) is developing an integrated pest management (IPM) approach to crown-of-thorns starfish (COTS) based on successful program developed by the US Environmental Protection Agency (EPA) and adapted further to Australian conditions by the NSW EPA. This “four-tiered” approach to practicing IPM is as follows:

1. Set action thresholds – Before taking any control action, an action threshold (a point when pest populations or environmental conditions indicate pest control action must be taken) needs to be set. Sighting a single pest, in this case a COTS, does not always mean control is needed. The level at which COTS will become an economic or environmental threat is critical for guiding future COTS control decisions.



2. Surveillance – The crown-of-thorns IPM strategy will monitor for the presence and numbers of COTS accurately, so appropriate control decisions can be made in conjunction with action thresholds. This surveillance removes the possibility that control efforts are wasted and ensures they are appropriate to the situation – that they are cheap, practical and effective. For example, control methods that target COTS adults alone could miss the opportunity to control COTS populations at earlier stages of their lifecycle through targeting spawning aggregations or interfering with larval dispersal and juvenile settlement. For those involved in surveillance, a level of training is required both in identifying COTS at various life cycle stages and in collection, where appropriate.

3. Prevent COTS from becoming a threat – IPM programs prevent COTS from becoming a major threat. In the marine environment this would mean both changing the conditions under which COTS thrive (i.e. reducing nutrient input into the Great Barrier Reef lagoon) and/or targeting populations earlier in their lifecycle before the most potentially destructive adult stage is reached. These control methods can be very effective and cost-efficient, and present little to no risk to people or the environment.

4. Control – Once monitoring and action thresholds indicate that COTS control is required, then the control efforts will be directed to where the COTS front can be most effectively addressed. This will allow the resources we have available to deliver the most effective control of COTS possible. Control methods may include:

- Trapping and removal
- Culling

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