

APLC research and development Strategic direction 2016-2021

OBJECTIVES

The primary role of the Australian Plague Locust Commission is to monitor and manage pest locust populations that pose a threat to agriculture in more than one Member State. Research and development activities are an essential part of ensuring that APLC undertakes this role with maximum effectiveness and efficiency.

The primary objectives for APLC research and development are:

1. To improve our ability to estimate locust populations and forecast the likely outcomes of these populations
2. To ensure that the necessary tools are available for an appropriate response to these populations, and to have the knowledge necessary to determine when, where and how to apply them
3. To have available the tools and knowledge to effectively manage the impact of our activities and operations

In implementing this strategic direction through priority R&D activities it is appropriate to consider:

- the NEEDS of APLC to effectively and efficiently deliver our agreed Charter within our established mandate
- the EXPECTATIONS of APLC stakeholders to provide outcomes consistent with our Charter, and to support their capability and activities
- the DRIVE of APLC officers undertaking the R&D, to ensure maximum engagement and application, undertake effective internal and external collaboration, and to provide appropriate development opportunity for staff

To deliver the Objectives within the context of those considerations, R&D activity is categorised into three research areas:

- (i) Population ecology, eco-physiology and behaviour
- (ii) Environmental impacts of locust control and monitoring activities
- (iii) Control agents and application technology

Research Area 1: Population Ecology, Eco-physiology and Behaviour

Elements and issues to be covered under this area include:

- The effectiveness of survey and data gathering to accurately estimate current populations
- The relative value and consistency of forecasting, depending upon generation and seasonal conditions
- Environmental influences on population behaviour
- Modelling the dynamics of population persistence, development and decline
- Environmental effects on survival and reproduction
- Factors involved in the initiation and cessation of diapause induction, and post-diapause quiescence
- Chemical ecology and other factors which drive aggregation
- The effect of high temperature exposures on nymph mortality and subsequent fecundity

Research Area 2: Environmental research

Elements and issues to be covered under this area include:

- Quantifying and minimising the environmental impacts of chemical pesticide application on Australian agro-ecosystems
- Improved understanding of control agent residue deposition, retention and fate
- Improved pesticide risk assessments for APLC pesticide application patterns

Research Area 3: Control Agents and Application Technology

Elements and issues to be covered under this area include:

- Refinement of application technology for current locust control agents
- Identification and development of alternative control agents, with revised application systems as necessary
- Improved effectiveness of *Metarhizium* through better definition of its effective scope for different species in different seasonal and regional situations

Specific activities undertaken within each of these research areas are detailed in the APLC Annual Report, including outcomes achieved and collaborations utilised to achieve them.