

# Bio-insecticide Crop Protection

## Business Opportunity

Our novel crop protection approach exploits a plant cyclic peptide system that appears to be used naturally by a diverse range of plants to protect against insect predation. This system involves proteins displaying a naturally broad range of insecticidal activity within non-crop plants. We are pursuing transfer of this natural system to produce a new generation of insect resistant crops, to provide improved or complementary properties to current Bt based varieties.

Manipulation of a natural plant system affords a higher level of technical ease in its application and is likely to be more publicly accepted than current bacterium-to-plant gene transfer products.



## Technology

These novel cyclic peptides are called cyclotides due to a unique structural framework, the Cyclic Cystine Knot (CCK). Already over 600 CCK-type proteins have been isolated and many have been characterised.

Potent insecticidal activity has been demonstrated for the cyclotides and they appear to affect a novel spectrum of insects. They have a marked effect on the growth and mortality of the global pest *Helicoverpa spp.* Cyclotide genes have been introduced and expressed in transgenic plants, and we are now optimizing for crop protection.

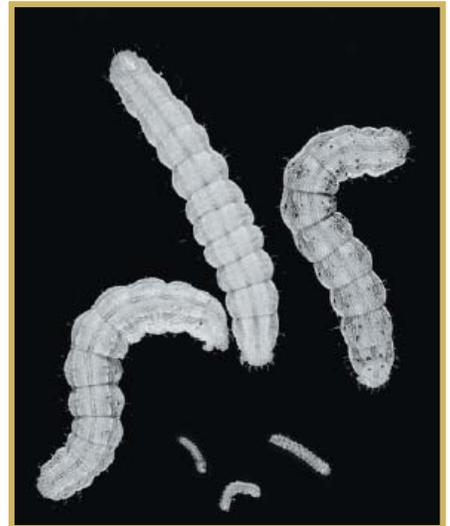
Problems of evolving resistance in insects such as those encountered by Bt, can be addressed by either drawing on the extensive pool of cyclotides available to us or by using them in combination with existing products.

## Market

The main opportunity for crop protection through transgenic expression is to displace traditional chemical pesticides by proving the economic, environmental and product advantages of transgenics. These advantages are now being recognized with introduced genetically modified crops expanding globally. We are targeting crop, forestry and horticultural applications.

## Investment Opportunity

Currently we are utilizing our proprietary intellectual property to demonstrate the efficacy of this system in a range of transgenic plants. We are seeking partners to fund and participate in further development and field trials.



This figure shows representative control insects and insects fed diets containing a cyclotide. After 16 days the control insects have reached maturity (25 mm in size, 300 mg in weight) while treated insects have not progressed past the first instar stage (2mm, 2mg) and pose no threat to crops. *Image courtesy of D. Craik (IMB/UQ).*