Centre Capabilities

We provide end-to-end capability to develop, prototype and validate PHA bioplastics, leveraging UQ's state-of-the-art facilities and research expertise.

What we offer:

- **Prototype product development:** films, extruded products, injection moulded parts, composites, coatings, 3D printing
- **Performance testing:** mechanical, thermal, barrier analysis
- **Bio/degradation assessment:** soil, marine, composting, anaerobic digestion, UV/accelerated aging
- **Advanced characterisation techniques**
- **Socio- and technoeconomic assessments**
- **Polymer processing:**
  - > Extrusion/reactive extrusion
  - > Fluidised bed spray coating
  - > Pan and drum coating
  - > Solvent casting/dip coating
  - > Film blowing
  - > Injection moulding
  - > Melt mixing
  - > Melt press
  - > Cryo-grinding
  - > Ball mill
  - > Parr pressure reactors

World-leading research

The University of Queensland

Ranked in the world's top 50, The University of Queensland is one of Australia's leading research and teaching institutions.

UQ School of Chemical Engineering

1 in Australia by Subject in the 2025 QS World University Rankings

Partner with us

Work with us to accelerate sustainable product innovation. Find out how

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

The University of Queensland
Andrew Liveris Building (46)
Web: centreforbioplastics@uq.edu.au
Phone: +61 7 3346 6466

Controlled release agricompounds using biodegradable polymers

Advancing our transition to a sustainable plastics future

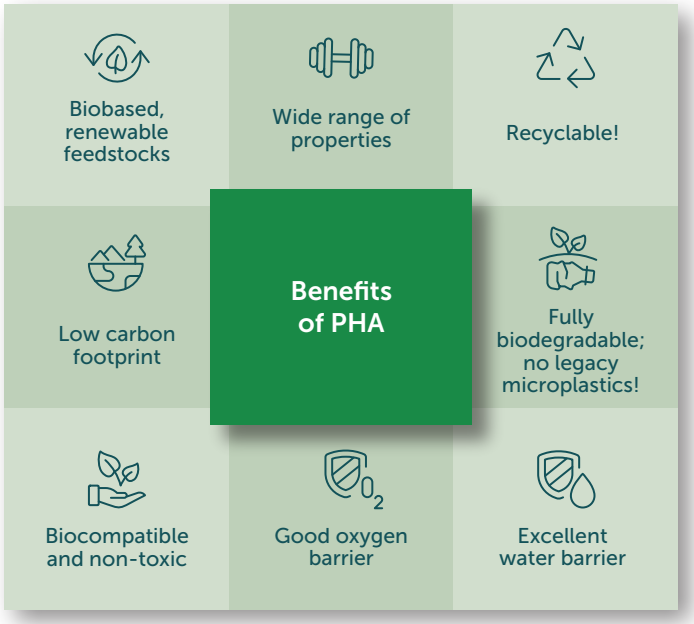
Co-develop sustainable materials from concept to real-world products

ARC Training Centre in
Bioplastics and Biocomposites

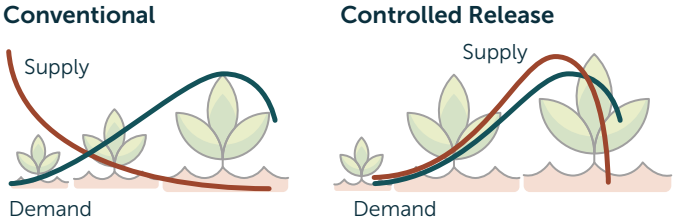
Why PHA? A natural, biodegradable plastic

PHAs (polyhydroxyalkanoates) are bio-based materials that biodegrade naturally in all environments, without creating microplastic residues. They provide sustainable alternatives to conventional plastics, offering versatile performance across a wide range of product application.

End-of-life	Bio-based	Fossil-derived
Biodegradable in natural environments	PHA Starch	PBS/PBSA PCL PBAT
Only biodegradable in industrial environments	PLA	
Non-biodegradable	BioPE PEF	PE PS PET PVC PP



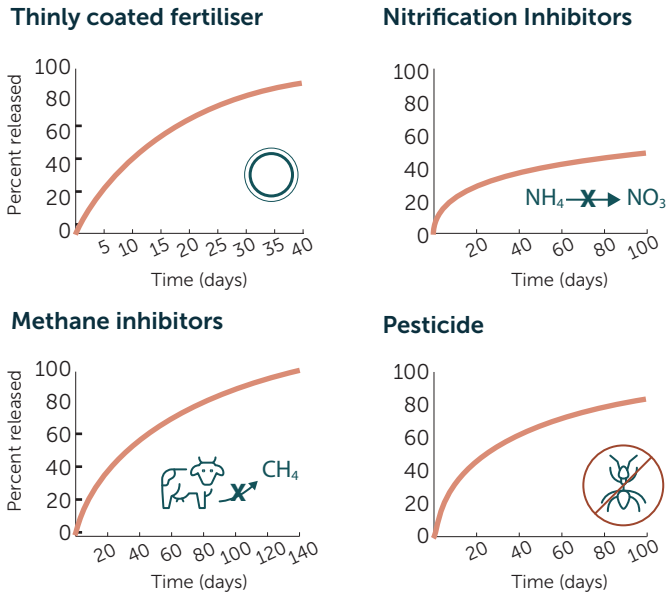
Why control agricompound release?



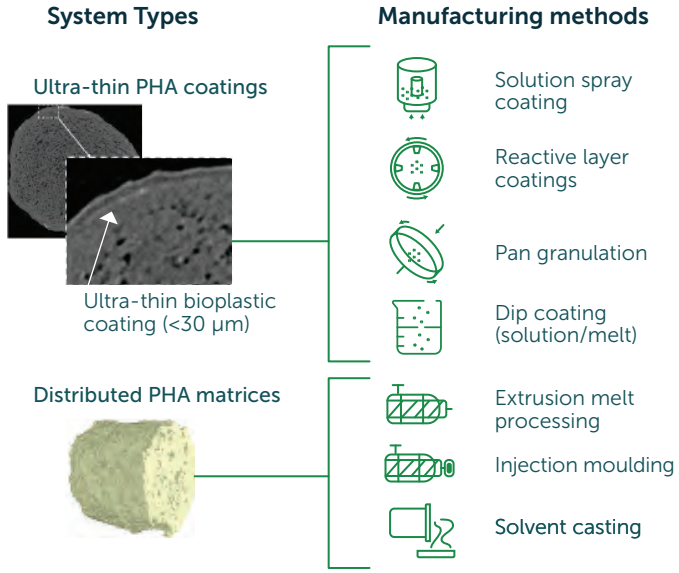
Example: controlled release fertiliser for improved plant update

- Extended activity/increased efficacy
- Higher update by target organism, whether it be plant, animal or microorganism
- Lower loadings required - reducing costs
- Reduced application frequency and associated labour and equipment costs
- Lower impacts on the environment, including greenhouse emissions and agricompound pollution
- Improved crop health and crop yields

Successful controlled release prototypes

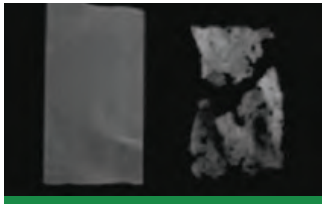


Our controlled release technologies

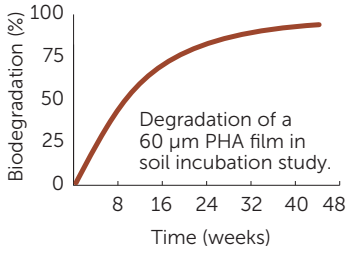


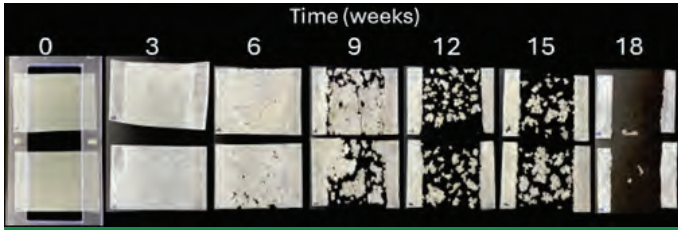
End-of-life: Biodegradation studies

PHA naturally biodegrades in all natural and engineered environments to CO_2, microbial biomass and water, with no legacy microplastic formation. We have confirmed PHA biodegrades rapidly in soil, marine water, compost and anaerobic digestion.



Soil biodegradation





Ocean biodegradation