

## Bio-Gene Technology Company Overview

May 2018

"AN AGTECH DEVELOPMENT COMPANY ENABLING A NEW GENERATION OF NOVEL INSECTICIDES THAT ADDRESS INSECTICIDE RESISTANCE"

Not for Distribution

## **BIO-GENE SNAPSHOT**



BIO-GENE TECHNOLOGY

**BETA-TRIKETONES** 

Platform Technology

An insecticide technology & IP development company

Key technology enabling a new generation of novel insecticides to address the increasing problem of insecticide resistance Data shows initial products **Flavocide™** & **Qcide™** can be highly effective for insect management

Potentially suitable for commercialisation as multiple target insecticides

Collaborate with commercial partners to bring multiple insect indications to market

Targeting public health, animal health & crop protection sectors

## **EXECUTIVE SUMMARY**



Novel insecticide platform leading to new effective products	Unique (new) mode of action (MoA) identified – alternative chemistry to current incumbent insecticides in a market seeking new products – opportunities in a range of market segments with multiple revenue sources
Strong test data	Significant test results (& new tests underway with world leading institutions) demonstrate effectiveness of Flavocide™ & Qcide™ at controlling resistant pests, as well as product safety
Multinational partnerships targeted	Aim to establish strategic testing partnerships with multinational public health, animal health & crop protection & consumer companies as part of Bio-Gene's partnership & commercialisation strategy
Manufacturing optimisation project underway with CSIRO	To produce Flavocide™ at commercial rates & pricing
Established global patents	Growing IP portfolio with additional applications filed
Appointment of new board members & advisors	Diverse skill set with significant industry experience

### **BOARD MEMBERS & MANAGEMENT**





**DON BRUMLEY** *Non-Executive Chairman* 

- 25+ years as a senior partner & leader of Ernst & Young – Oceania
- Significant experience across IPOs, transactions, audit & advising growing entrepreneurial companies



RICHARD JAGGER
CEO & Managing Director

- 20+ years working in agriculture globally
- Most recently employed as Managing Director of Sinochem Australia
- Previously spent 15+ years at Monsanto in various management roles



PETER MAY

Executive Director, R & D

- 20+ years experience in crop protection market with companies Orica & Crop Care Australasia (now Nufarm)
- Founded Xavca, consulted to companies such as Syngenta & Sorex (BASF)
- Former CEO & Chairman of BioProspect (now Medibio, ASX:MEB)



**ROBERT KLUPACS** *Non-Executive Director* 

- 30+ years corporate experience in international tech development
- Previously MD & CEO of ASX-listed Circadian Technologies Ltd
- Previously MD & CEO of ES Cell International Pte Ltd
- Registered Australian patent attorney



**KEVIN RUMBLE**Non-Executive Director

- Founding Director of Bio-Gene
- 20+ years experience in new plant propagation, farming & live plant transport techniques
- Involved in the development of Qcide<sup>TM</sup> & development of Flavesone as a first step in the commercialisation of Flavocide<sup>TM</sup>



ROGER MCPHERSON

Chief Financial Officer &

Company Secretary

- 15+ years experience as CFO & Company Secretary across both listed & unlisted companies
- Experience in the pharma manufacturing, biotech & biopharma industries
- Previously CFO & Co-Sec of TPI Enterprises (ASX:TPI)

## **KEY ADVISORS TO THE BOARD**





**DOUG RATHBONE**Advisor to the BGT Board

- 40+ years experience in agriculture, most recently as Managing Director of Nufarm, a position he held for 15+ years
- Under his leadership, Nufarm became one of Australia's most successful agricultural firms with global sales >\$2.5B



PROF. CATHERINE HILL

Purdue University

BGT Scientific Advisory

Board Member

- Purdue University, Dept. of Entomology
- Showalter Faculty Scholar
- President's Fellow for the Life Sciences
- Authority in new insecticide development & novel chemistry



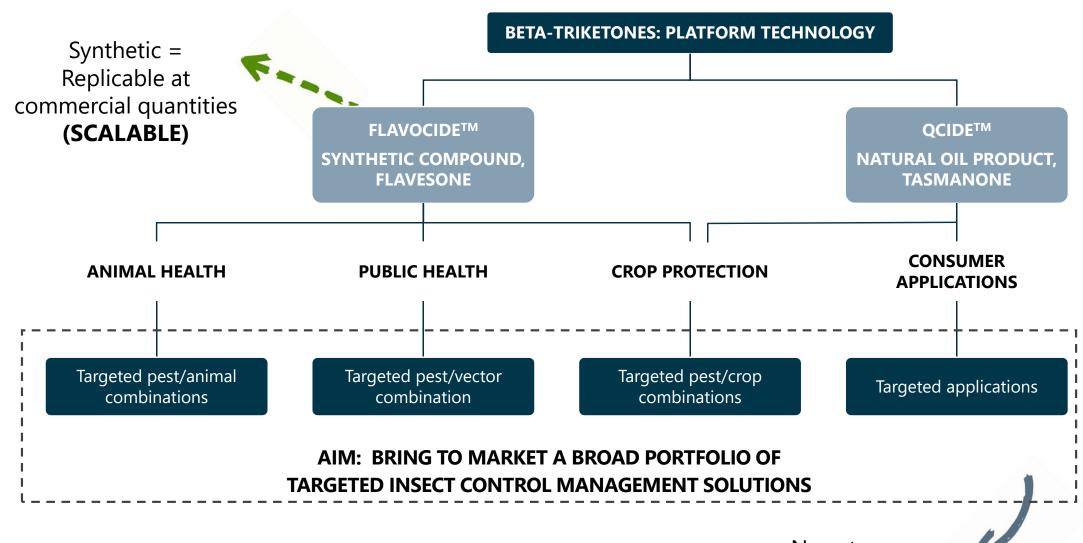
NEIL ANDERSON

Chemistry & Manufacturing
Consultant

- Industrial Chemist
- Employed by Monsanto for 40 years
- Specialist in formulation development, production, & process management
- Qualified for manufacturing plant audits, quality & environmental management

## **BIO-GENE TECHNOLOGY APPROACH**

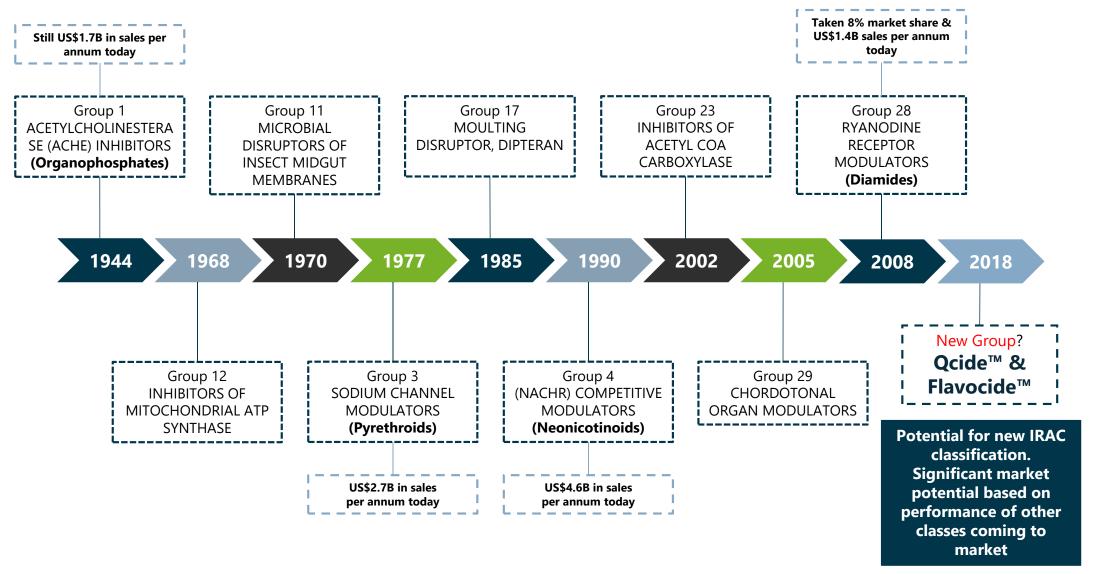




Near-term consumer opportunities available with Qcide™

# NOVEL MODE OF ACTION (EXAMPLE CROP PROTECTION)

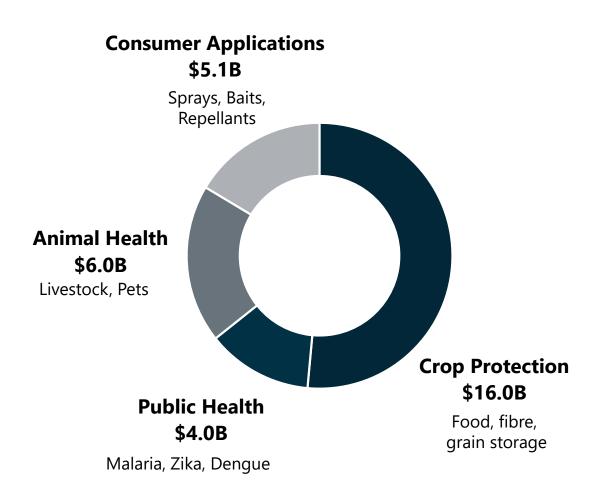




Currently performing research to identify specific sites within the known unique channel

## LARGE GLOBAL, GROWING MARKETS





Industry dominated by multinational AgChem companies













Seeking Safe Novel Solutions to complement off-patent insecticides

BIO-GENE TECHNOLOGY

AgTech with access to new technology platform leading to new insecticides desired by AgChem industry

# SEGMENTS / PESTS



SEGMENT	PESTS
Animal health	Ectoparasites (ruminants): cattle tick (Rhipicephalus microplus), buffalo fly
	Ectoparasites (companion animals): paralysis tick, fleas
Public health	Mosquitoes, flies
<b>Urban pests</b>	Flying pests, cockroaches, ants, other crawling pests
Grain storage	Lesser grain borer ( <i>Rhyzopertha dominica</i> ), Flat grain beetle ( <i>Cryptolestes</i> spp.) & others
Crop	Lab & microcosm bioassays: Red legged earth mite ( <i>Halotydeus destructor</i> ) Green peach aphid Russian wheat aphid Diamondback moth <i>Helicoverpa armigera</i>
	Field testing: Two-spotted mite Cotton aphid White fly Lepidopterous larvae Brown plant hopper (rice; Thailand)

## **PROGRESS & GOALS**

BGT continues to build a suite of research data across a number of pests and verticals

		Research Partner Committed	Initial Testing	Follow Up Testing	Commercial Partnership	Product Development	Legend:
Crop Protection	Beneficial Arthropods						Underway / Agreed U
	Lesser Grain Borer						
	Other Grain Storage Pests						
	Russian Wheat Aphid						
	Green Peach Aphid						
	Diamond Backed Moth						
	Cotton Bollworm						
	Brown Planthopper						
	Silverleaf Whitefly						
	Red legged Earthmite						
	Two Spotted Mite						
Public Health	Aedes aegypti Mosquito						
	Culex Mosquito						
	Anopheles Mosquito						
Consumer	Mosquito						
	Housefly						
	Crawling Pests						
Animal	Cattle Tick						
Health	Buffalo Fly						

## **GRAIN STORAGE PESTS**



 Combination treatments with Flavocide™ shown to control the full spectrum of key pests evaluated, including strains resistant to currently used insecticides

Chemical Class	Lesser grain borer	Flat grain beetle	Sawtoothed beetle	Flour beetles	Grain weevils
Flavocide™+ OP	<b>✓</b>	<b>✓</b>	<b>✓</b>	✓	<b>✓</b>
Flavocide™+ SP	<b>✓</b>	n/a	n/a	n/a	n/a
Flavocide™	✓	✓	✓	-	-
Organophosphates	*	✓	*	✓	✓
Pyrethroids SP	✓	✓	✓	✓	*
S-methoprene IGR	*	-	✓	-	-
Spinosad	✓	-	-		-

<sup>✓</sup> activity

n/a test not yet conducted

Demonstrates the compatibility of Flavocide™ with resistance management strategies currently being used in the grain protection industry

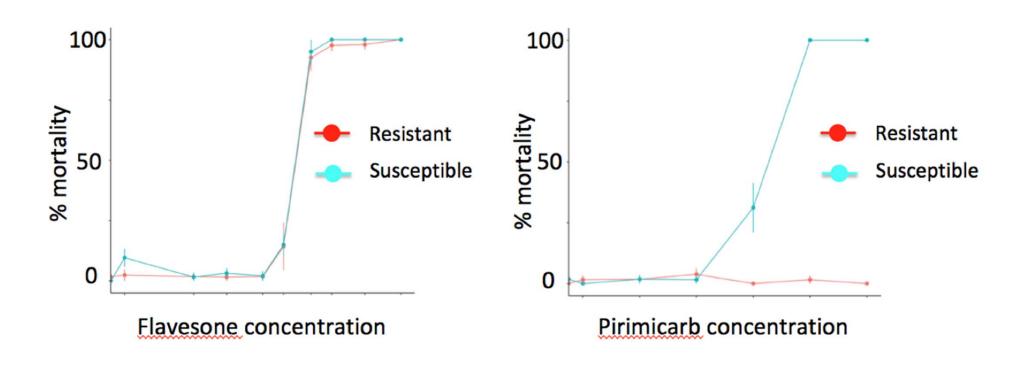
no activity

<sup>\*</sup> resistance widespread

## **GREEN PEACH APHID**



 Control of susceptible and highly resistant strains of Green peach aphid demonstrated



Flavocide™ outperforms Pirimicarb (a commonly used insecticide) in control of a highly resistant strain of the pest

## **TOXICOLOGY UPDATE**



- Flavocide<sup>TM</sup>
  - Completed acute toxicity six pack
  - Mutagenicity & carcinogenicity tests completed
  - Chronic toxicity testing seven day sighting study completed
  - 28 day toxicity study (dermal & oral) commenced
  - Physical/chemical studies completed
- Qcide<sup>TM</sup>
  - Preliminary toxicity testing completed
  - Acute toxicity six pack commencing

## **GROWING INTELLECTUAL PROPERTY**



"METHODS & COMPOSITIONS FOR CONTROLLING PESTS" Platform patent family Key granted patents in key territories covering the use of beta-triketones as insecticides **Expiring 2022** 

Insect/crop combination patent families

Insect/animal combination patent families

Manufacturing processes

Trade secrets

Recent provisional patent filings which, when granted, extend patent life to **2038** 

Data currently generated for submission mid year

New patent lodgings relate to control of resistant populations, and impact on synergy with existing chemistry

Further filings over next 6-24 months covering specific combinations, specific resistant pest control, new formulations, dose ranges etc

# ADDING VALUE BY IMPROVING FLAVESONE MANUFACTURING



Existing process shows Flavesone is highly scalable

2,5,10 & 20kg batches produced for collaborators & partners Keys areas for process improvement (cost reduction & efficiency):

Ingredients/intermediates

Time

Manufacturing method



#### **CSIRO** collaboration

- · Provides unique internal knowhow
- Experts in process improvement
- Collaboration commenced March 2017 – supported by CSIRO with \$50k "kick-start grant"

#### Results to date...

- Yield improvement of >50%
- Indicative cost reduction of >50%
- Unique process developed (I.P.)
- Further expected improvement over next 6-12 months, possible further grant

# ONGOING IMPROVEMENTS IN QCIDE<sup>TM</sup> PRODUCTION



Production agreement with farmers

Finalising agreement for tissue culture / cloning program

Improvements in oil extraction processes

Improved trees

Improved harvest

**Quality** control

#### **New collaboration**

- Provides specific tree production knowledge & programs
- Experts in extraction processes
- Potential for government grant

## 2018 GOALS & OBJECTIVES



## Communicate with potential partners

Demonstrate activity of lead molecules

Implement regulatory & Toxicology studies

Improve production processes

#### **Update**

- Introductory meetings held with 7 international companies to date, with 4 NDAs already signed. Further meetings planned with additional companies
- Continued work on significant pests and efficacy on resistant populations. More studies to be reported on soon
- 28 day sighting study completed for Flavocide<sup>™</sup> awaiting report but no red flags.
- Qcide<sup>™</sup> "6 pack" base toxicology work about to commence
- Physico / chemical analysis studies completed
- Phase three commenced on CSIRO Flavocide<sup>™</sup> production project
- Partner identified and protocols agreed for tree development program and Qcide<sup>TM</sup> extraction improvement project

## 2018 GOALS & OBJECTIVES



## Continue to clarify Mode of Action

Generate data to develop further I.P.

Recruit leading scientific & industry specialists

Other developments

#### **Update**

- Next phase commencing which identifies specific "site" of application within known unique channel
- Data generated to support our additional patent applications, which will be submitted early July.
- Manufacturing I.P identified via CSIRO project
- Continue to review efficacy studies for any additional I.P. opportunities.
- · Highly experienced manufacturing & formulation specialist consultant recruited
- Continue to identify and align with experts in appropriate fields
- · Identification of grant potential and on-going applications
- Review opportunities for complimentary technology

### REGULAR NEWS FLOW SINCE LISTING



- 28/05/2018 Positive Results With Flavocide<sup>TM</sup> vs. Grain Storage Pests
- 26/04/2018 Positive Efficacy Test Against Another Major Crop Pest (GPA)
- 17/04/2018 Manufacturing Project with CSIRO Advances To Stage 3
- 09/04/2018 Positive Result In Efficacy Test With Major Cereal Crop Pest (RWA)
- 26/03/2018 Positive Results For Flavocide<sup>TM</sup> With Major Rice Pest (Planthopper)
- 21/03/2018 Animal Health Testing And Collaboration Update (Virbac)
- 01/03/2018 Prospectus For Loyalty Options Lodged
- 14/02/2018 Key Appointments To Advisory & Management Teams (Hill and May)
- 31/01/2018 Pilot Study Shows Flavocide<sup>TM</sup> Activity Against Mosquitos (Purdue)
- 21/12/2017 Bio-Gene 2018 Goals & Objectives Following Successful IPO
- 19/12/2017 Bio-Gene Announces Positive Safety Results
- 11/12/2017 Bio-Gene Reports Positive Initial Efficacy Results (RLEM)
- 04/12/2017 Bio-Gene Appoints Mr Doug Rathbone as an Advisor
- 01/12/2017 Bio-Gene Extends Research Collaboration With QDAF
- 30/11/2017 Bio-Gene Extends Research Collaboration With CSIRO
- 29/11/2017 Bio-Gene Completes \$7.1m IPO to List on ASX

## **CORPORATE UPDATE**



	Numbers	Description		
Shares on Issue	127,724,471	Includes all shares both quoted and not quoted		
Voluntary Escrow Shares	17,097,682	Shares come out of escrow 30/5/18		
Remaining Escrow Shares	21,051,299	Various release dates commencing 28/6/18 through to 29/11/19		
Shares Currently Quoted on ASX	106,673,172	Does not include the shares subject to ASX imposed escrow		
Current Market Cap	\$20.4 million	Based on closing share price on 29/5/18 of \$0.16		

<sup>\*</sup> Excludes 2,000,000 Broker Options and 25,056,730 Loyalty Options

## **CORPORATE UPDATE**



Cash held at 31 March 2018 - \$7.2 million

 As per Prospectus and per current plans funds will last well into 2019 (excludes any potential proceeds from Loyalty Options)

 Some funds have been reallocated from Flavocide<sup>TM</sup> to Qcide<sup>TM</sup> research

 Loyalty Options expire 4 December 2018, potential to raise ~\$5 million

## **SUMMARY**















New insecticide platform chemistry, beta-triketones demonstrating a novel mode of action

Enables products Flavocide™ & Qcide™ shown to be effective against insecticide resistant pests

Applications across multiple market segments including public health, animal health, consumer products & crop protection / grain storage

Significant opportunity for ongoing development through partnerships with major AgChem companies

Collaborative approach per application can be duplicated across projects providing many product opportunities

Established global patents & intellectual property with additional applications filed

Appointment of new board members & advisors with diverse skill set & significant industry experience



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