

Bio-Gene Technology presents latest study results of its insecticide product Flavocide™ at the Australian Grain Storage and Protection Conference

Australian agtech company, Bio-Gene Technology (ASX:BGT), developer of the next generation of novel insecticides to address insecticide resistance, presented the latest study results of its product Flavocide, a nature-identical insecticide compound, versus a range of grain storage pests at the NWPGP Australian Grain Storage and Protection Conference in Melbourne on June 20.

Speaking at the conference was Bio-Gene's Executive Director R&D, Peter May, who contributed to the topic of "Managing Insects and Grain", a section which covered the current status of insect resistance management in Australia, insect infestation trends, as well as insect detections in the supply chain.

Results from studies evaluating Flavocide as a grain protectant for control of major grain storage pests were announced by Bio-Gene in late May ([see link here](#)), and were generated as part of a collaborative research project with the Queensland Government's Department of Agriculture & Fisheries (DAF).

Test results confirmed that Flavocide was effective against both susceptible and resistant strains of lesser grain borer, saw-toothed grain beetle, rusty grain beetle, rice weevil and flour beetle when used in combination with chlorpyrifos-methyl (an organophosphate (OP) from Dow AgroSciences). Further combination testing with deltamethrin (a synthetic pyrethroid (SP) from Bayer CropScience) and Flavocide demonstrated effectiveness in controlling an SP-resistant strain of lesser grain borer.

Both chlorpyrifos-methyl and deltamethrin are currently used as grain protectant insecticides, and grain storage pests exhibit varying levels of resistance to these products. As such, the grains industry is continually looking for novel insecticidal compounds to complement and to be used to in combination with existing chemistry, and as part of resistance management programs.

The results from these tests showed that combination treatments with Flavocide could effectively control the full spectrum of key pests including resistant strains which is encouraging. As a consequence, Bio-Gene intends to carry out further tests with Flavocide alone and in combination to evaluate the residual efficacy of Flavocide, which is an important requirement for industry acceptance.

In practice, sequences or rotations of compounds provide an effective approach to resistance management. The objective is to prevent or delay resistance developing to insecticides, or to help regain susceptibility in insect pest populations in which resistance has already arisen. Flavocide's unique mode-of-action (MoA) is important as it could provide a means for addressing the increasing problem of resistance to existing classes of insecticides when used in combination with products already on market.

Losses of grains and grain-based products caused by insects remain a global problem, ranging from approximately 10% in temperate regions to almost 50% in humid tropical areas¹. The protection of stored grain is an important economic necessity, particularly grain used for domestic human consumption and export which must not contain live insects.

¹ Wijayarathne, L.K.W., F.H.Arthur, S.Whyard (2018) Methoprene and control of stored-product insects. *Journal of Stored Products Research* Vol 76, March 2018, pp161-169

Finding a product with a unique MoA is rare with only a limited number of new novel insecticides reaching the market in recent years. Peter May explained Bio-Gene was very fortunate to have discovered a product with a unique MoA which is showing considerable promise in testing to date.

“It’s a very exciting time for us and we’ve been welcomed into the sector by a number of players because they’re having significant problems with resistance and are looking for new products,” Mr. May says. “We’re seeking to collaborate with other suppliers to maximize the applications and effectiveness of our technology and had some excellent meetings at the conference with suppliers and members of the industry which could lead to further research and commercial agreements in the future”.

Compatibility of Flavocide™ with current grain resistance management strategies

Chemical Class	Lesser grain borer	Rusty grain beetle	Sawtoothed beetle	Flour beetle	Rice weevil	
Flavocide™ + OP	✓	✓	✓	✓	✓	✓ activity
Flavocide™ + SP	✓	n/a	n/a	n/a	n/a	- no activity
Flavocide™	✓	✓	✓	✓	✓	* resistance widespread
Organophosphates	*	✓	✓	✓	✓	n/a test not yet conducted
Pyrethroids SP	*	✓	✓	✓	*	
S-methoprene IGR	*	-	✓	✓	✓	
Spinosad	✓	-	-	-	-	

The table above demonstrates the compatibility of Flavocide™ with resistance management strategies currently being used in the grain protection industry, that utilise combination treatments comprising products of different modes of action to control resistant insect strains and also prevent the development of resistance to products still effective.

About the NWPGP Grain Storage and Protection Conference 2018

The annual Grain Storage and Protection Conference of the National Working Party on Grain Protection (NWPGP) was held in Melbourne on 19-20 June 2018. Over 125 delegates attended the annual 2 day conference to hear from a range of presenters on updates related to chemical use and its effectiveness, insect resistance, changing supply chain storage conditions, market access issues and compliance programs to meet market needs. The outcomes of the conference with agreed actions will be provided to industry shortly and also made available on the [GTA website NWPGP page](#).