

RMR[®]

Range



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Agriculture Reimagined



IMTRADE
CropScience

WHO ARE WE?

Optimising profitability for farmers through R&D and innovation

Imtrade CropScience is a 100% Australian operation providing optimised crop protection solutions to Australian growers via a substantial home-grown R&D program.

Since 1981, Imtrade CropScience has built an enviable position nationally delivering high-loading formulations, novel combinations and synergised options for Australian primary producers. We are independent, reacting nimbly and flexibly in meeting Australian needs.

While many others lay claim to technical proficiency, our R&D ethic is real and is evidenced by an extensive registration and patent portfolio, the employment of 16 scientists, a nationally-accredited laboratory, our own spray-booth, greenhouse and an unquenchable thirst for innovation in agriculture.



RANGE CONCEPTION

RMR[®]

RMR[®] Concept

The Resistance Management Regime (RMR[®]) is a synergised range of insecticides and miticides, conceived in response to resistance issues. The highly successful launch of Cyborg[®] Plus has provided a platform for a range of formulations incorporating Piperonyl Butoxide (PBO) synergist.

The Power of PBO

PBO is well-established in society with a history of use stretching back to the 1940's. PBO works by effecting the ability of insects and mites to break down pesticides into less harmful components by inhibiting mixed function oxidase enzymes. PBO acts as a synergist, enhancing the effect of insecticides and miticides whilst having no direct impact on insects and mites when applied in isolation.

PBO was developed more than 70 years ago in the USA from sesame oil as a result of efforts to conserve pyrethrum stock. PBO has a wide spectrum of insecticidal and miticidal synergy, good stability (alone and as a component of formulations) and low impacts outside of target organisms (safe to humans, domestic animals and birds).

Why is PBO Important?

- Blocks insect and mite production of mixed-function oxidase enzymes
- Reduces the pests ability to metabolise active ingredients
- Enhances desired effects of the pesticide
- Improves the efficacy of following applications
- Does all of this safely and responsibly



Understanding PBO

PBO has been widely studied over a long period. It is well understood and commercially established globally. Its favourable safety profile sees it applied freely in commercial and domestic settings including kitchens, home gardens and animal enclosures.

PBO is not a scheduled poison and is commonly incorporated into modern domestic insect sprays (aerosols included). It is non-volatile, non-persistent in soils and of low acute toxicity (University of Hertfordshire 2021). PBO is conducive to inclusion in liquid concentrate forms offering broad formulation possibilities and is miscible in a wide spectrum of hydrocarbons, exhibiting good compatibility with many active ingredients. Efforts to improve upon PBO as a crop protection synergist have failed to date. No alternative offers its economy, efficacy and safety.

Piperonyl Butoxide was first registered in the U.S.A in the 1950s and in Australia in 1994. It is a well-known product in the Cotton industry due to *Helicoverpa Armigera* outbreaks in early 2000's (Young et al., 2005). As a synergist component it is frequently used with 3A insecticides (pyrethrins and pyrethroids), nerve & muscle targets and generally fast-acting.

Why PBO?

- ✓ **Widely studied**
- ✓ **Used globally**
- ✓ **Effective synergist**

The RMR® Range

Patriarch® RMR® Insecticide

Motto® RMR® Miticide (coming 2023)

Media® RMR® Miticide (coming 2023)

Myriad® RMR® Miticide/Insecticide (coming 2023)

Architect® RMR® Insecticide (coming 2023)

Empire® RMR® Miticide/Insecticide (coming 2023)

Benefits of RMR®

- Resistance management tool
- Stable formulation enhanced with synergist





Patriarch® RMR® Benefits

Superior Protection - Patriarch® RMR® is the product of choice for silverleaf whitefly (SLW) control in cotton. Due to its lengthy residual control, Patriarch® RMR® controls the progeny of silverleaf whitefly fly-ins. In adults it causes male sterility and inhibits ovulation (blocks the egg laying in the next cycle).

IPM Friendly - Pyriproxyfen is a proven IPM-Friendly active ingredient that is non-toxic to mammals, birds, and adult honeybees.

Enhanced by PBO - Patriarch® RMR® employs Piperonyl Butoxide (PBO), a well-known synergist that enhances the efficacy of insecticides and miticides whilst being safe to humans and non-target species.

Unique Formulation - Patriarch® RMR's® unique co-formulation offers superior stability and a favourable safety profile, plus 3x the active concentration of other registered products. The active ingredient, Pyriproxyfen belongs to insecticide group 7C, a juvenile hormone mimic. This acts as an Insecticide Growth Regulator (IGR), interfering with the reproduction and development of target insects, reducing the population levels.

Increased Savings

A grower with 1,000ha of cotton would require only 167L of Patriarch® RMR®, compared to 500L of Pyriproxyfen (100g/L) at label rates. In addition, in the case of a re-seller servicing 20,000ha of cotton territory, only 3,350L of Patriarch® RMR® would be required versus 10,000L of pyriproxyfen (100g/L). With storage space, transport and handling important considerations in modern farming practices, Patriarch® and the RMR® product range are transforming the landscape.



Crops and insects controlled

Cotton, Cucurbits* , Leafy Lettuce and Sweet Potatoes
Silverleaf Whitefly

Fruiting Vegetables* and Nursery Stock*
Silverleaf Whitefly, Greenhouse Whitefly and Tomato Potato Psylid

Citrus
Red Scale, Black Scale, Citrus Snow Scale and Cottony Cushion Scale

Mangoes
Mango Scale and Pink Wax Scale

Olives
Black Scale

* Refer to label for full list of crops, pests and rates



Motto® RMR® Benefits

Excellent Control - Motto® RMR® Miticide contains Etoxazole, a non-systemic active with translaminar activity, acting as a moulting hormone agonist. It controls mite eggs (ovicidal action), larvae and nymphs, indirectly affecting adults by sterilising females. Motto® RMR® inhibits the synthesis of exoskeleton and consequently blocks the development of the insect to reach its following life-cycle stage.

Long-Term Control - Etoxazole belongs to group 10B mode of action (MoA). It is a mite growth inhibitor affecting CHS1, inhibiting the enzyme that catalyses the polymerisation of Chitin. Chitin plays its key role in insect structure exoskeletons and other internal structures. The physiological function affected in insects is 'growth' and that is why it is known as an Insect Growth Regulator (IGR). The insect development is controlled by juvenile hormone and ecdysone, by directly perturbing cuticle formation/deposition or lipid biosynthesis. Such insect growth regulators are generally slow to moderately slow acting. As a result, its maximum control will take place within 10-14 days if applied in the correct timing when mite infestation has not peaked, providing excellent long-term control.

IPM Friendly - Motto® RMR® an IPM-friendly miticide and is soft on predators. Biological control (with predator mites) is recommended in conjunction with Motto® RMR® use. PBO is incorporated into a stable formulation, improving miticide efficacy and assisting resistance management tactics of target organisms. Besides its low toxicity to humans and low environmental impact, another benefit of translaminar movement in plant material is to target mites on the underside of leaves where they feed.



Registration Pending



Media® RMR® Benefits

Highly Effective - Media® RMR® Miticide contains Hexythiazox, a non-systemic active with contact and stomach action. It is effective on mite eggs, larvae and nymphs. Additionally, eggs laid by treated females are non-viable.

Growth Inhibitor - Hexythiazox has a Group 10A mode of action (MoA). It is a mite growth inhibitor affecting the CHS1 enzymes that catalyse the polymerisation of Chitin. Chitin plays its key role in insect structure exoskeletons and other internal structures. As an Insect Growth Regulator (IGR), pest development is thwarted by directly perturbing cuticle formation/deposition or lipid biosynthesis. Insect growth regulators are generally slow to moderately slow acting with maximum control taking place within 3 weeks, as adult mites will need to have their life-cycle completed.

IPM Friendly - Media® RMR® is soft on predatory mites (e.g. *Galendromus occidentalis*, *G. pyri*, *Phytoseiulus persimilis* and *Euseius womersleyi*). Biological control (predator mites) is recommended with Media® RMR®. PBO incorporation, as with other RMR® range components, counters metabolic degradation thereby aiding in resistance management.



Registration Pending



MYRIAD[®]

RMR[®] MITICIDE

Myriad[®] RMR[®] Benefits

High-Loading - Myriad[®] RMR[®] is a high-loading version of abamectin 18 or 36, common concentrations in the marketplace.

Fast Acting - The abamectin in Myriad[®] RMR[®] belongs in the Avermectin family (Group 6, (IRAC)), allosterically activating glutamate-gated chloride channels (GluCl_s), causing paralysis in mites and insects. Glutamate is an important inhibitory neurotransmitter, acting on nerves and muscles of target arthropods.

IPM Tool - As an important IPM tool for a resistant management strategy, it is crucial to make no more than one spray with abamectin and rotate with other miticides (Motto[®] RMR[®], Media[®] RMR[®], Mogul[®] VeripHy[®] and Machine[®]). PBO has been added to its stable formulation, improving miticide/insecticide efficacy and assisting resistance management tactics.



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For more information on the RMR[®] range, visit imtrade.com.au
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