

Bt Basics

DiPel®
BIOLOGICAL INSECTICIDE

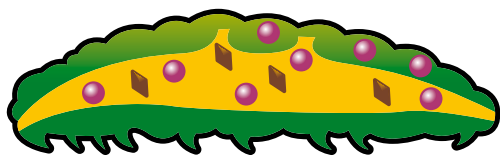
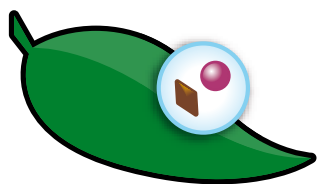
XenTari®
BIOLOGICAL INSECTICIDE

Bt

Bts (*Bacillus thuringiensis*) are naturally occurring bacterium commonly found in soil. Certain strains infect and kill insects. These strains have been developed for use as biological insecticides.

DiPel® and **XenTari®** are the leading biological insecticides worldwide for the control of lepidopteran larvae. Both are specially prepared dryflowable formulations containing live spores and endotoxin of naturally occurring bacterium (Bt), *Bacillus thuringiensis* subsp. *Kurstaki* in the case of DiPel and *Bacillus thuringiensis* subsp. *Aizawai* in the case of XenTari.

HOW DO THEY WORK?



Bts require ingestion. When ingested, the toxins bind to the mid gut of pest larvae and cause cell death, rapidly inhibiting further insect feeding. Bt products also include Bt spores, which germinate inside the insect and contribute to mortality. This means larvae stop feeding within hours and crops are protected from damage straight away. Death occurs within 3-4 days.

WHERE DO YOU USE BtS?

- DiPel is used in a wide range of agricultural crops where control of Lepidoptera (moths and butterflies) caterpillars are a problem.



Resistance management rotation option



No re-entry Interval



No WHP, no residues



Safe to all beneficial insects



Stops feeding immediately

- XenTari is the premium Bt for control of caterpillars in brassica crops, particularly Diamondback moth (*Plutella*).
- DiPel and XenTari are both used where growers want caterpillar control with the benefits of no re-entry period, no withholding periods and no operators safety concerns.
- DiPel and XenTari are perfect for IPM (Integrated Pest Management) and IRM (Insect Resistance Management) systems.
- DiPel and XenTari are the mainstays of caterpillar control in organic production systems and are both Australian Organic Registered Farm Inputs.

WHY USE A BT?

Bts are very specific. Whilst they are lethal to target insects they are safe to beneficial insects. This means that natural predators continue to assist in controlling pest populations after spraying.

Bts are also safe to the environment. DiPel and XenTari have no WHP, no re-entry interval and are non-scheduled non-poisonous products. They are also Australian Organic Registered Farm inputs. This makes them easy to work with and apply as well allowing them to be used right up until harvest.

IPM AND RESISTANCE MANAGEMENT

As they are friendly to beneficial insects Bts are perfect for IPM programs. Bts are slower to develop resistance issues than other chemicals and offer a different mode of action making them a great rotation option. Strategic application of Bts depending on the stage of the season and insect growth can alleviate the need to rely on traditional chemicals and often improves their efficacy later on.

INFORMATION FOR ADVISORS

Bt

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NOT ALL BTS ARE CREATED EQUAL

Tests on Bt products have shown that some contain low levels of toxin proteins and low potency resulting in reduced efficacy. Both DiPel and XenTari are manufactured to the highest standards by Valent BioSciences (VBC) in the USA. VBC see fermentation of the insecticidal proteins produced from Bt strains as a mixture of science and art. Every batch of DiPel and XenTari must meet a number of sampling and potency checks throughout production to ensure the quality and efficacy of the toxin proteins in every batch.



Each batch of DiPel is tested on over 2000 lepidopteran larvae at various stages in manufacturing.

Getting the best from **DiPel®** and **XenTari®**

There are some very straightforward ways of ensuring you get the maximum benefits from DiPel and XenTari.

- Ensure water pH is less than 8 as high pH level may reduce efficacy.
- Use a surfactant at label rates and a high water rate to ensure good coverage. Feeding attractants may also improve the intake of DiPel DF however good coverage is critical.
- Avoid rain or irrigation for 24 hours after spraying.
- To reduce the impact of UV breakdown spray after 4pm. Good results have been achieved by growers spraying at night.
- Careful monitoring of pests and beneficial insect levels is important. Knowing what pest pressure you have and what stage they are up to is important in knowing when to spray and how often.
- Spraying at egg hatch is most effective. The smaller instars of the key caterpillar pests are significantly easier to control than large instars. Additionally, the large instars have not yet already caused damage to the crop.
- DiPel and XenTari are most effective used early in the season when pest pressure is moderate and beneficials are present. This allows natural predators to continue to assist in controlling pest populations after spraying.
- To maintain beneficial insects ensure other products used in the spray program have a low impact on beneficials, ensure hard chemicals like pyrethroids are not used on the same or adjacent fields and ensure tank lines are cleaned after the use of other pesticides.
- In grape vines, continual monitoring is difficult and LBAM generations may overlap some growers have found it beneficial to use DiPel as part of a cover spray program, spraying every 2 weeks during high pressure periods.

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