DiPel® SC

BIOLOGICAL INSECTICIDE

SELECTIVE CONTROL FOR SUSTAINABLE FORESTRY

Product Technical Manual

SUMITOMO CHEMICAL
AgroSolutions Division

DiPel is a biological insecticide based on *Bacillus thuringiensis* subsp. kurstaki, delivering strong control of lepidopteran pests. It works through spores and protein toxins that activate in the alkaline gut of caterpillars when ingested. Produced by fermentation, DiPel has been used globally for over 50 years and is proven to be safe and effective.

DiPel SC, a suspension concentrate liquid, is now registered for lepidopteran pest control in forestry., while the dry formulation, DiPel DF, has been registered for many years but is less suited to low-volume aerial application.

DiPel SC was specially formulated for aerial forestry application. It is an oil based suspension concentrate formulation that performs well when applied by air at low water rates.

Minimising Hazardous Pesticide Use

Outbreaks of lepidopteran pests, such as autumn gum moth and loopers, are often managed with alpha-cypermethrin, classified as a Highly Hazardous Pesticide (HHP) by the Forest Stewardship Council (FSC). Forest managers are increasingly focused on reducing chemical use and eliminating HHPs in line with FSC certification and plantation best practice.

Selective Solutions for Sustainable Forestry

Growing interest in environmentally responsible pest management has driven the adoption of more selective approaches. DiPel SC offers an effective biological solution, controlling target pests while preserving beneficial predators to support ongoing forest health.

Trial results

Some trials were conducted directly by forestry companies, while additional trials were carried out by Sumitomo Chemical Australia researchers with support from forestry company staff who are members of the Forest Pest Management Consortium.

Control of Autumn gum moth in the Hamilton area of Victoria
Ground sprayed trial in April 2022

AGM Population 23rd April No./ branch	UTC	Dipel SC 2.0	Dipel SC 2.5	Dipel DF 1.0	Alpha Cypermethrin
	8.67	6.98	5.17	8.02	5.81

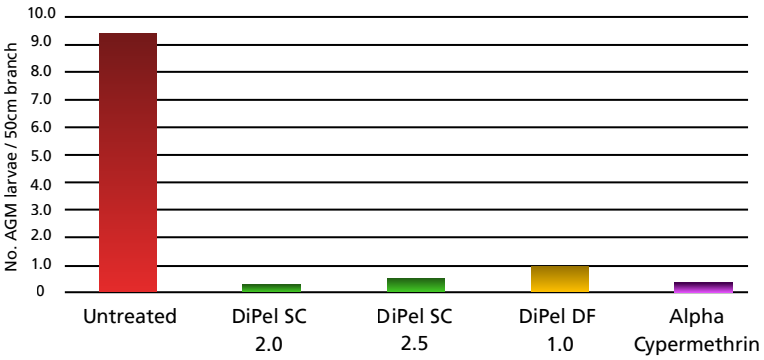
Trees starting to be damaged

Autumn gum moth larvae (*Mnesampela privata*) and leaf damage

Some predation by parasitic wasps -but population too high and leading to severe defoliation.

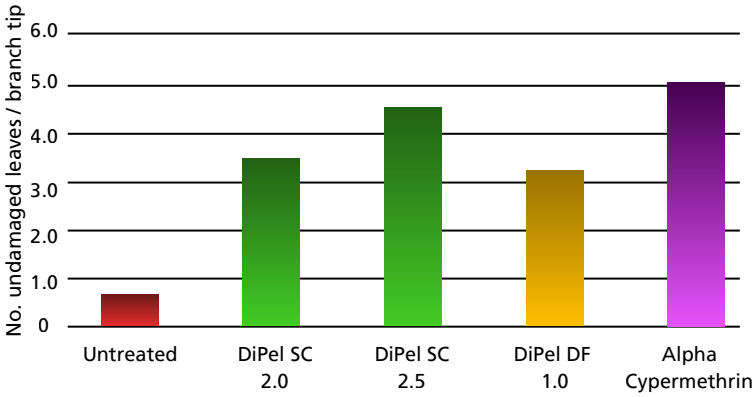
Control of Autumn Gum Moth

Ground spray on 24th April at 750 L/Ha
AGM abundance 14DAT (May 2024)
II – III instar larvae



Protection of Eucalyptus foliage

Ground spray on 24th April
Undamaged leaves on branch tips
36DAT (May 2024)



Aerial trial in April 2024

Helicopter applying DiPel in 50L water per hectare plus surfactant and fourth instar larvae damage.

Results comparing DiPel DF with SC in controlling 4th instar larvae

Treatment		Product Rate	Control of autumn gum moth larvae (No. larvae/50cm branch)		Treatment Efficacy (%)*
			30th April (pre-treatment)	7th May (7DAT)	7th May (7DAT)
1	UTC	-	19.8	15.7	-
2	DiPel SC	2.5 L/Ha	13.9	1.73	88
3	DiPel DF	1.0 kg/Ha	18.4	9.30	50
Paired t test P -value (UTC v Dipel SC)			0.0930	0.0002	
Paired t test P-value (UTC v Dipel DF)			0.8113	0.0132	
Paired t test P-value (Dipel SC v Dipel DF)			0.5086	0.0046	

Note: Its is recommended that DiPel is applied on earlier stage larvae as they are easier to control and less damage will occur.

Eucalyptus globulus shoot growth on 30th May 2024 (30 DAT)

Treatment		Product Rate	No. undamaged new leaves / infested branch 30th May (30DAT)
1	UTC	-	0.53
2	DiPel SC	2.5 L/Ha	3.58
3	DiPel DF	1.0 kg/Ha	1.90
Paired t test P -value (UTC v Dipel SC)			0.0016
Paired t test P-value (UTC v Dipel DF)			0.0617
Paired t test P-value (Dipel SC v Dipel DF)			0.0268

This trial demonstrates that, even under challenging conditions with large fourth-instar larvae, DiPel SC achieved 88% control and significantly reduced damage. By leaving predatory beneficials intact, the trees were able to recover and maintain growth. This highlights the value of DiPel SC as a sustainable and effective option for forestry pest management.

Critical considerations for effective use of DiPel SC in forestry

Timing is critical: Early detection of eggs and very young larvae is essential. Apply DiPel before larvae progress beyond first instar, as larger larvae are more difficult to control.

Application method and volume:

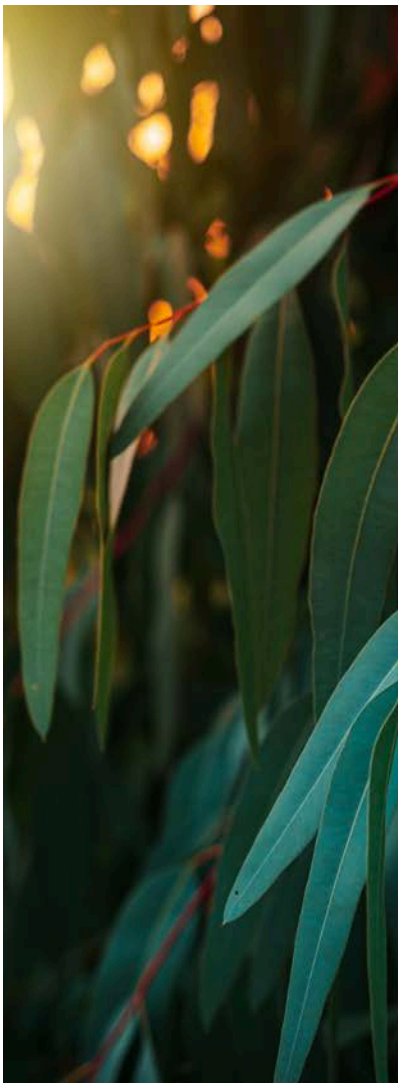
Aerial application: 50 L water/ha with a non-ionic surfactant to improve coverage

Ground application: 500–750 L water/ha with a non-ionic surfactant

Application timing: Evening applications are preferred, as UV light degrades DiPel toxins.

Product rate: Apply 2.0–2.5 L/ha, using the higher rate for larger trees or more challenging canopies.

Follow-up and monitoring: One application may be sufficient; however, monitoring larval numbers around 7 days post-application is recommended. A second application can be considered if required, while accounting for beneficial insects and overall IPM objectives.



Loopers in Sandalwood

Hyposidra looper (Hyposidra talaca) is a major pest of northern Australian sandalwood. Traditionally controlled with alpha-cypermethrin, a 2023 trial found that 1.25 kg/ha DiPel DF applied aerially in 50 L water plus a non-ionic surfactant caused 67% mortality at 6 days and 97% at 10 days. DiPel SC, better suited to aerial use at 2–2.5 L/ha, would be a more cost-effective alternative.

For further information on DiPel SC please contact:

Andrew Franklin (FNQ)	0408 063 371
Danita Clark (Central QLD)	0447 000 622
Stephan Logoida (SE Qld & NSW Northern Rivers)	0455 110 415
Ardina Jackson (NW NSW)	0477 967 509
Charles McClintock (S NSW)	0429 004 290
Frank Galluccio (NW VIC & Riverina)	0418 502 466
Jack Bartels (Eastern VIC & TAS)	0488 036 313
Sam Boyce (Eastern VIC)	0439 707 218
Matthew Hincks (SA)	0409 807 301
Imre Toth (WA)	0429 105 381
OR our Sydney office:	(02) 8752 9000

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