

NZ Sports Turf Institute

Bowls Chemical Guide



2021 – 2022

www.nzsti.org.nz



DISCLAIMER

The information provided in this guide by the NZ Sports Turf Institute is given in good faith. However, due to the large number of variables involved at any particular site, and in the absence of control over how the information is to be applied, any action taken in reliance of this guide is at the sole discretion of the user of the information and is taken at his or her risk.

© New Zealand Sports Turf Institute 2021

All rights reserved. The contents of the New Zealand Sports Turf Institute SportsTurf Bowls Chemical Guide are protected by copyright and may not be reproduced in any form without the written permission of NZ Sports Turf Institute. NZ Sports Turf Institute is not responsible for any mistakes, omissions, typographical errors or changes to product descriptions over time.




INTRODUCTION

Correct and accurate application of chemicals is a priority for all bowling clubs in New Zealand. The NZSTI Bowls Chemical Guide is intended to provide our 'Members' with up-to-date information on the correct application rates and methods for chemicals used on bowling greens.

USING THIS GUIDE

The keys below will help you interpret the tables in the NZSTI Bowls Chemical Guide.

Key	
✓	Effective on pest/ weed/ disease. Not necessarily registered for control of specified disease/pest/weed on cotula or starweed.
P	Partial control
NZ	Registered in New Zealand for control of pest/ weed/ disease in cotula
NZ _T	Registered in New Zealand for control of pest/ weed/ disease in turf
NZ _p	Registered in New Zealand for control of pest/ weed/ disease in pasture
Pre	Pre-emergent herbicide
?	Effectiveness of fungicide/ herbicide/ pesticide for control of pest/ weed/ disease is unknown

Colour key	Herbicide phytotoxicity risk
	Low phytotoxicity risk when used as directed
	Moderate phytotoxicity risk; follow guidance notes
	High phytotoxicity risk; do not use

CHEMICAL RATES

Application rates are based on a 36.6x36.6m green (area = 1340m²).

The basis of the rates recommended is as follows:

- Where a NZ rate is registered for an active ingredient, then all the formulations for this active ingredient have been converted on the basis of this registration.
- Where a NZ registration does not exist for an active ingredient, then the rates are based on international registrations.
- Where a NZ or international registration does not exist, the rate is based on what is working in the field.

DISEASE CONTROL

COMMON DISEASES ON STARWEED AND COTULA BOWLING GREENS



Figure 1. *Sclerotinia minor* on starweed.



Figure 2. Brown patch - North Island.



Figure 3. Fairy ring.



Figure 4. Rolfs disease.



Figure 5. *Sclerotinia minor* on *Cotula maniototo*.



Figure 6. Brown patch - South Island.



Figure 7. Gold bracelet disease.



Figure 8. *Phytophthora*.

Disease control				Target							Comments
Active Ingredient(s)	Trade Names	Activity	Rate (per 1340m ² green)	Algal slime	Brown patch	Gold bracelet, summer spotting	Fairy ring	Phytophthora	Rolf's disease	<i>Sclerotinia minor</i>	
Azoxystrobin 250g/L	AGPRO Azoxystrobin 250SC Amistar® SC Atlantis® Flo Avoir 250SC Inspire® Roxy® Salute™ Tazer®	Systemic	160 - 320ml		NZ _T ²	✓	NZ _T ¹		✓		Best used as a preventative rather than curative. ¹ Tazer, AGPRO Azoxystrobin 250SC, Avoir 250SC - apply at 160–320ml in 110 – 220L of water for controlling fairy ring. ¹ Inspire, Salute, Orbit - apply at 135–270ml/green in 110–220L of water for fairy ring. Fairy rings can be also treated in the autumn at renovation when the surface is open. At other times you will need to spike the green surface to 15 – 20mm and apply a penetrant/wetting agent a day prior to applying the fungicide. Wash in after application with at least 10mm of water applied as short pulses.
Azoxystrobin 800g/kg	Avior 800 WG	Systemic	50 – 100g		✓	✓	NZ _T ³		✓		² Inspire & Salute - apply at 135–270ml/green in 110–220L of water for Brown patch ³ Avior 800 42 – 100g in 110 – 220L of water To avoid resistance, avoid two consecutive applications.
Azoxystrobin 62g/L & propiconazole 104g/L	Headway® Maxx	systemic	1.2L		NZ _T	✓			✓	✓	Best used as part of a preventative programme with other fungicides; apply before any symptoms occur when conditions favour disease. Do not apply any more than two consecutive applications at 28 day intervals. Do not apply to plants under heat or moisture stress.

Disease control		Target									Comments
Active Ingredient(s)	Trade Names	Activity	Rate (per 1340m ² green)	Algal slime	Brown patch	Gold bracelet, summer spotting	Fairy ring	Phytophthora	Rolf's disease	<i>Sclerotinia minor</i>	
Bacillus subtilis	Bacstar™	Bio – fungicide contact	135 – 270g		NZ _T					?	Mixing with Du-Wett adjuvant is recommended. Apply at 7 – 10 day intervals when conditions are favourable for disease.
	Serenade Max		337 – 540g		NZ _T				?		
	Clarity		36 – 72g		NZ _T					?	Apply at 7 – 10 day intervals when conditions are favourable for disease.
	Serenade®Optimum		169 – 338g		NZ _T					?	Apply at 7 – 10 day intervals when conditions are favourable for disease.
	Companion		1.7L		✓					?	Apply in 74 – 100L of water at 14 – 28 day intervals. Registered internationally on turf.
Captan 600g/L	Captan 600Flo	contact	1.1L		NZ _T					✓	Cotula and starweed are more susceptible to damage at high rates (such as used when controlling slime). Apply in overcast conditions.
			4L	✓							
Captan 800g/kg	Capetec® Captan 800WG Fruitfed Captan 80WG Merpan™	contact	800g		NZ _T ¹					✓	Shake liquid formulations thoroughly, before measuring out the required amount of chemical. ¹ Capetec, Fruitfed Captan 80WG, Merpan are registered for controlling Brown patch on turf.
			3kg	✓							
Captan 900g/kg	AGPRO Captan 900 WDG Crop Care Captan 900 WG	contact	700g		NZ _T						
			2.6kg	✓						✓	

Disease control		Target									Comments
Active Ingredient(s)	Trade Names	Activity	Rate (per 1340m ² green)	Algal slime	Brown patch	Gold bracelet, summer spotting	Fairy ring	Phytophthora	Rolf's disease	<i>Sclerotinia minor</i>	
Carbendazim 500g/L	AGPRO Carbendazim Carbenz Chief® Donaghys Liquid Mycotek® Goldazim® 500SC MBC 500 Flo Prolific® Protek® Sporeguard X-Spore	systemic	800ml		✓	P			P	✓	Can also be used to reduce the casting caused by earthworms (refer insecticide section of this guide).
Chlorothalonil 720g/L	AGPRO Chlorothalonil 720 Balear® 720SC Barrack® Betterstick Barrachlor® 720™ Blizzard 720SC Bravo® Weatherstik Cavalry®720SC Thalonil	contact	940ml-1.8L		NZ					✓	6.1B substances – Certified Handler Certificate required.
Chlorothalonil 250g/L & Thiophanate-methyl 250g/L	Taratek™ 5F	systemic and contact	1.3 - 2L		NZ	NZ			P	NZ	Shake thoroughly, before measuring out the required amount of chemical. 6.1B substance– Certified Handler Certificate required.
Chlorothalonil 362g/L, Propiconazole 57g/L & fludioxonil 14.5g/L	Instrata®	systemic and contact	2.4L		NZ _T	?			✓	✓	Best used as part of a preventative programme with other fungicides, apply before any symptoms occur when conditions favour disease. Do not apply any more than two consecutive applications at 28 day intervals. Do not apply to plants under heat or moisture stress. 6.1B substance– Certified Handler Certificate required.

Disease control		Target									Comments
Active Ingredient(s)	Trade Names	Activity	Rate (per 1340m ² green)	Algal slime	Brown patch	Gold bracelet, summer spotting	Fairy ring	Phytophthora	Rolf's disease	<i>Sclerotinia minor</i>	
Fluazinam	AGPRO Fluazinam 500 Curalan® Flick 500SC Gem® Nando® Pinnacle™	contact	170mls		✓					?	Registered internationally for preventative control of Brown patch. DO NOT apply more than 3 application of fluazinam per season. DO NOT mow or water treated area until turf or lawn is thoroughly dry, ideally allow 24 hours.
Fosetyl-aluminium 800g/kg	Aliette WG® Fostonic 80 WP®	systemic	250 - 500g					✓			
Iprodione 500g/kg	Rovral® WP	systemic	670g – 1.3kg		NZ				✓	✓	Apply in 65 -70L of water for all formulations. Apply in overcast conditions.
Iprodione 500g/L	Defence™ 500 Ippon® 500 SC Rapid™ 500 Rover® FLO Rovral® AquaFlo	systemic	650ml - 1.3L		NZ				✓	✓	To reduce the risks of resistance avoid applying two consecutive applications.
Mancozeb 750g/kg	AGPRO Mancowall Defensor® Dithane Rainshield Neotec Eurozeb 75 WG Kencozeb 750 WG Manco 75 WG Manzate Evolution Penncozeb® DF Promanz® Unizeb® DF	contact	2.7 - 3.3kg		NZ†					✓	Cotula and starweed are more susceptible to damage at the high rates required with liquid formulations to control slime. Apply in overcast conditions. Only Penncozeb DF and Unizeb DF are registered for use on turf.
			3 - 3.8kg	✓							
Metalaxyl-M 250g/L	AGPRO Helios Phytospear™ Speartek™ Ventura®	systemic	400-800ml					✓			Needs to be washed in when controlling phytophthora.

Disease control		Target									Comments
Active Ingredient(s)	Trade Names	Activity	Rate (per 1340m ² green)	Algal slime	Brown patch	Gold bracelet, summer spotting	Fairy ring	Phytophthora	Rolf's disease	<i>Sclerotinia minor</i>	
Metalaxyl-M 40g/kg & Mancozeb 640g/kg	Ridomil® Gold MZ WG	systemic and contact	800g					✓			Needs to be washed in when controlling phytophthora.
Phosphorous acid 400g/L	Foschek™ HI PK Phosgard™ Tree-Doc®400SL	systemic penetrant	1 – 1.3L					NZ _T			Agri-fos, Phosgard & Tree-Doc are registered for use on turf. Pre wet the thatch. Apply in 100L of water. Wash in immediately after application with 6mm of water.
Phosphorous acid 600g/L	Agri-fos® 600	systemic penetrant	670 – 938ml					NZ _T			
Prochloraz 450g/L	AGPRO Standbye 450EC Sportak® EW Varicur® 450EW	systemic	130 - 260ml			P				✓	Needs to be washed in when controlling gold bracelet.
Prochloraz 462g/kg	Octave® Curator	systemic	130 – 260g			P				✓	
Propiconazole 250g/L	Aurora™ Pro-P™	systemic	400ml		P	✓			✓	✓	
Pyraclostrobin 250g/L	Convoy™ Comet® Pyrax®	systemic	160 - 285ml		✓		✓		✓		Preventative control of brown patch only. For fairy ring; use the higher rate, wash in after application and treat when symptoms are first observed.
Tebuconazole 250g/kg	Corona® 250WG Folicur® WG	systemic & contact	335-675g		✓					?	Not widely used. Apply in overcast conditions when turf is not under stress. Best used preventatively.
Tebuconazole 250g/L	AGPRO Envy	systemic & contact	335-675ml		✓					?	
Tebuconazole 430g/L	Compass® Folicur®SC Hornet™ 430SC	systemic & contact	200-400ml		✓					?	

Disease control		Target									Comments
Active Ingredient(s)	Trade Names	Activity	Rate (per 1340m ² green)	Algal slime	Brown patch	Gold bracelet, summer spotting	Fairy ring	Phytophthora	Rolf's disease	<i>Sclerotinia minor</i>	
	Rebuke 430SC										
Tebuconazole 500g/L	Axis Gold™	systemic & contact	170-335ml		✓					?	
Tebuconazole 800g/kg	Donaghys Myco-RF®	systemic & contact	106-209g		✓					?	
Thiram 400g/L	Thiram 40F	contact	2L		✓					✓	Cotula and starweed are more susceptible to being damage at the high rates required with liquid formulations to control slime. Apply in overcast conditions.
			6L	✓							
Thiram 800g/kg	Thiram 80 WDG Fungus Control Thiram	contact	1kg		✓					✓	
			3kg	✓							
Triadimenol 250g/L	AGPRO Jupiter® Vandia® 250EC	systemic	400 - 800ml			?			✓	✓	
Triademenol 375g/L	Tribute™SC	systemic	270 – 530ml			?			✓	✓	
Triforine 190g/L	Saprol®	systemic	Drench. See comments.				P			P	20-50ml in at least 10L of water/10m ² applied as a drench for fairy rings.
Trifloxystrobin 500g/L	Protiva®	systemic	40 – 100ml		✓	?			✓		Best used as part of a preventative programme with other fungicides, apply before any symptoms occur when conditions favour disease.
Trifloxystrobin 500g/kg	Flint® Triplus®	systemic	40 – 100g		✓	?			✓		

WEED CONTROL

COMMON WEEDS ON BOWLING GREENS



Figure 9. Colobanthus.



Figure 10. Frilled Liverwort.



Figure 11. Pearlwort.



Figure 12. Silver moss.



Figure 13. Crassula (Tillaea).



Figure 14. Hydrocotyle heteromeria.



Figure 15. Poa annua.



Figure 16. Toad rush.

Weed Control					Target													Comments						
Active ingredient	Trade name	Species	Plant safety	Rate (per 1340m ² green)	Carrot weed	Clover	Crassula/Tilliaea	Colobanthus	Hydrocotyle	Moss	Creeping oxalis	Pearlwort	Pratia	Starweed	Twincress	Agrostis mucosa	Browntop	Cynodon	Fescue	Poa annua	Toad rush	Scirpus		
Dichlorophen 432g/L	LawnPro Mossclear	Dioica	Yes	8 - 12L						NZ														Do not use during frosty conditions. Use the same application method as detailed for benzalkonium chloride.
		Maniototo																						
		Starweed																						
Dichlorophen 432g/L	AGPRO Boss Mostox®	Dioica	Yes	5.3 - 8L						NZ														
		Maniototo																						
		Starweed																						
Haloxypop 100g/L	AGPRO Haloxypop 100 Fopp 100 Hurricane® Ignite™ Scorp® EC	Dioica	Yes	150 - 200ml												✓	✓	✓		✓				Haloxypop is foliar absorbed. Apply with 50L of water. Grass needs to be actively growing. Withhold mowing a couple of days prior to and following application to optimise uptake and control.
		Maniototo																						
		Starweed																						
Haloxypop – P 520g/L	Crest™ Gallant™ Ultra Haloxyken 520 Valliant® 520	Dioica	Yes	30 - 40ml												✓	✓	✓		✓				
		Maniototo																						
		Starweed																						
Mecoprop –P active isomer 600g/L	Duplosan® KV	Dioica	Yes	100ml																				In the South Island use only on healthy, non-stressed maniototo in summer leaf. Can damage maniototo when applied in the autumn. Foliar absorbed. Apply ½ rate in two directions. Withhold mowing for 1-2 days before and after application to optimise uptake and control. Apply on an overcast day.
		Maniototo	Partial																					
		Starweed	No																					

Weed Control					Target													Comments						
Active ingredient	Trade name	Species	Plant safety	Rate (per 1340m ² green)	Carrot weed	Clover	Crassula/Tillaea	Colobanthus	Hydrocotyle	Moss	Creeping oxalis	Pearlwort	Pratia	Starweed	Twincress	Agrostis mucosa	Browntop	Cynodon	Fescue	Poa annua	Toad rush	Scirpus		
MCPA 750g/L	AGCARE MCPA 750 AGPRO MCPA 750 Agritone® 750 Maestro™ MCPA 750 MCPA Amine 750 Orion MCPA 750 Pasture Guard®MCPA 750 Rainbow & Brown MCPA 750 Synergy™ MCPA 750	Dioica	Partial	125 & 75ml					P					P	P									
		Maniototo	Yes						P						P	P								
		Starweed	No																					
Oxadiazon 380g/L	Exadia® Oracle® 4See	Dioica	Yes	250 – 300ml																				
		Maniototo	Partial																					
		Starweed	Partial			*			Pre	✓ & Pre	Pre				Pre	✓		Pre	Pre	Pre	Pre	Pre	Pre	P
<p>The programme involves during late summer, when maniototo is in the summer leaf, and dioica is healthy and actively growing:</p> <ul style="list-style-type: none"> Initially applying the higher rate of MCPA @125mls/green. 3 – 4 weeks applying the lower rate of 75mls/green. <p>The Cotula must be in good condition. Do not spray Cotula that is weak or under stress.</p> <p>Pay particular attention to health of cotula around the ends prior to spraying.</p> <p>In the case of Cotula dioica some surface thinning of the dioica is likely.</p> <p>* Higher rate of 400-430ml/green is needed for controlling tillaea and can result in yellowing of cotula, especially when applied during autumn. Do not use within at least 8 weeks of sowing starweed seed or maniototo bulbils. Provides post and pre-emergent control of moss. Don't apply when cotula is still growing though soil. Will stop germination in bare areas.</p> <p>If using to suppress scirpus, water lightly afterwards</p>																								

Weed Control					Target													Comments							
Active ingredient	Trade name	Species	Plant safety	Rate (per 1340m ² green)	Carrot weed	Clover	Crassula/Tillaea	Colobanthus	Hydrocotyle	Moss	Creeping oxalis	Pearlwort	Pratia	Starweed	Twincress	Agrostis mucosa	Browntop	Cynodon	Fescue	Poa annua	Toad rush	Scirpus			
Propyzamide 500g/L	Fiera® Kerb® 500F Polka™ Precare®	Dioica	Yes	500 – 1000ml				P						P		*	*		✓	*				* Lower rate of 150-200ml/green can be used if targeting grasses only. Root absorbed and hence needs to be applied in a high-water rate (100L of water). Apply when green is wet and wash in with at least 10mm of water. Do not let water pond on the green when watering in.	
		Maniototo	Yes																						
		Starweed	No																						
Triclopyr 162g/L	Lawnpro hydrocotyle	Dioica	Yes	220- 370ml																				Maniototo must be in its summer leaf stage. Foliar absorbed. Apply 1/2 rates in two directions. Withhold mowing for 1 - 2 days prior to and following application. More effective where the soil profile is moist and plants are not stressed. Apply on an overcast day.	
		Maniototo	Partial		✓	P		✓	✓		P	✓													
		Starweed	Yes																						
Triclopyr 600g/L	AGPRO Triclo 600 Brush Off® Eliminate Grazon® Rainbow & Brown Triclo Scrubcutter® Terminate Triclopyr 600	Dioica	Yes	60 - 100ml																				Lower rate is recommended when treating hydrocotyle on Starweed greens. Can soften plants and increase bruising from play.	
		Maniototo	Partial		✓	P		✓	✓		P	✓													
		Starweed	Yes																						

PEST CONTROL

COMMON PESTS ON BOWLING GREENS



Figure 17. Cotula weevil.



Figure 18. Greasy cutworm.



Figure 19. Porina.



Figure 20. Nematode damage.



Figure 21. Earthworm.



Figure 22. Greasy Cutworm damage.



Figure 23. Porina cast.



Figure 24. Sod webworm.

Pest Control				Target											Comments		
Active ingredient	Trade names	Activity	Rate (per 1340m ² green)	Black beetle larvae	Black beetle adult	Cotula weevil larvae	Cotula weevil adults	Earthworms	Grass grub larvae	Grass grub adults	Greasy cutworm	Mealy bug	Nematodes	Porina	Sod webworm		
Alpha-cypermethrin 100g/L	Alpha-Scud® Bestseller®100EC Cypher® Dominex®100EC Picture®100SC Sheriff® 100	contact	35 - 50ml		✓		✓			✓	✓			✓	✓	Needs to be applied in 100L of water. Contact action so good coverage over leaf is required. Avoid mowing for at least a day and irrigation for 12 hours after spraying. Toxic to bees.	
Bifenthrin 80g/L	AGPRO Bifenthrin Avia® No Pests®X-it Ant	contact & ingestion	200ml								✓				✓	Apply in at least 50L of water and wash in after application with 4mm of water.	
			200 – 600ml		✓		?										
Bifenthrin 100g/L	Assail® Biflex® AquaMax Biflex® Ultra 100EC No Pest Crawling Insect Spray Recruit 100 SC Talstar® 100 Telemark Venom®		160ml									✓					✓
			160 – 480ml		✓		?										
Carbaryl 500g/L	Sevin®Flo	contact	325ml							✓	✓			✓	✓	Can be applied a maximum of three times per year. Adjacent and other neighbours requesting so must be notified. Venue must be closed to all people for a minimum of 12 hours after spraying. Toxic to bees.	

Pest Control				Target											Comments		
Active ingredient	Trade names	Activity	Rate (per 1340m ² green)	Black beetle larvae	Black beetle adult	Cotula weevil larvae	Cotula weevil adults	Earthworms	Grass grub larvae	Grass grub adults	Greasy cutworm	Mealy bug	Nematodes	Porina	Sod web worm		
Carbendazim 500g/L	AGPRO Carbendazim Carbenz Chief® Donaghys Liquid Mycotek® Goldazim® 500SC MBC 500 Flo Orion Carben 500SC Prolific® Protek® Sporeguard X-Spore	systemic	1 – 1.3L					✓									Will reduce the casting caused by earthworms. Needs to be used when earthworm casting is first observed. Wash in after application or apply during falling rain. Repeat applications are generally required at 6 – 8 weekly intervals.
Chlorantraniliprole 200g/L	Acelepryn Coragen®	contact, ingested & systemic	100 - 200ml	NZ _T		✓			NZ _T		NZ _T			✓	NZ _T		Acelepryn is registered for use on turf. Low toxicity. <u>Most effective on the larvae/grub stage</u> of the insect. If adults present use a knock down insecticide first. Provides 3 - 6 months control. If targeting caterpillars, do not mow or irrigate for at least a day after application. If targeting grass grub, black beetle or cotula weevil it needs to be washed in with about 6mm of water. Toxic to bees
Chlorpyrifos 480g/L	Chlor-P™ 480EC Chlorfos 480 Donaghys Insec 480 Pychlorex® 48EC Pyrinex®	contact & vapour	160 - 215ml		P		✓			P	✓			NZ _P	✓		Providing the plant is not under stress and it is not to sunny/hot, spraying should ideally be carried out in the late afternoon or early evening.
Chlorpyrifos 500g/L	Chlorpyrifos 500EC Hortcare Chlorpyrifos 50EC Lorsban® 50EC	contact & vapour	155 - 200ml		P		✓			P	✓			NZ _P	✓		Adjacent and other neighbours requesting so must be notified. Venue must be closed to all people for a minimum of 24 hours after spraying. Toxic to bees.

Kensban 500																
Pyrinex®500EC																
Toppel® 500																

Pest Control				Target											Comments	
Active ingredient	Trade names	Activity	Rate (per 1340m ² green)	Black beetle larvae	Black beetle adult	Cotula weevil larvae	Cotula weevil adults	Earthworms	Grass grub larvae	Grass grub adults	Greasy cutworm	Mealy bug	Nematodes	Porina	Sod web worm	
Diazinon 200g/kg	Diazinon® 20G Gesapon 20G	contact & ingested	740g		P		✓			✓	✓			NZ _P	✓	Not widely used on bowling greens. Apply at renovation, so granules are covered with soil. Venue must be closed to all people for a minimum of 24 hours after treatment.
			1.5kg	P					NZ _P							
Diazinon 800g/L	Diazate Diazol® 800	Contact & ingested	135-200ml		P		✓			✓	✓			NZ _P	✓	For grass grub larvae wash in after application with 5-10mm of water or apply during rain. Adjacent and other neighbours requesting so must be notified. Venue must be closed to all people for a minimum of 24 hours after spraying. Maximum of two applications per year. Toxic to bees.
			400ml	P					NZ _P							
Diflubenzuron 240g/L	Dimilin® 2L	ingested	7ml											NZ _P		Product must be ingested and stops the caterpillar moulting. Most effective against early larval instars before they reach 20-25mm. Apply 10 weeks after peak moth flight. Generally first application is in the early autumn. Only controls Porina caterpillar.
Diflubenzuron 250g/kg	Avert® 25WP	ingested	7g											NZ _P		
Diflubenzuron 250g/L	Sniper™	ingested	7ml											NZ _P		

Fenamiphos 400g/L	AGPRO Canyon Fenafos 400 Nemacur Nematak® 400EC	systemic	2.7L*										✓		<p>*Only one application permitted per year. Maximum rate is now 2.7L/green. Spike before application. Ensure profile is wet. The use of a penetrant wetting agent can assist. Apply product and wash in with 10mm of water applied as short pulses. Best applied before damage is too severe.</p> <p>Toxic, observe full safety precautions and close green for a minimum of 48 hours and preferably 5 days.</p> <p>6.1B substance</p>
-------------------	--	----------	-------	--	--	--	--	--	--	--	--	--	---	--	--

Pest Control				Target											Comments	
Active ingredient	Trade names	Activity	Rate (per 1340m ² green)	Black beetle larvae	Black beetle adult	Cotula weevil larvae	Cotula weevil adults	Earthworms	Grass grub larvae	Grass grub adults	Greasy cutworm	Mealy bug	Nematodes	Porina	Sod web worm	
Imidacloprid 350g/L	Confidor® Cyrus® Nuprid® 350SC Savage 350	systemic	185 - 200ml	✓	✓		✓									Systemic insecticide that is translocated upwardly within the plant. Needs to be applied in 100L of water so that insecticide gets into the plant crown. Toxic to bees
Imidacloprid 600g/L	AGPRO Imidacloprid Acclaim™ Pronto®	systemic	108-116ml	✓	✓		✓									
Lambda-cyhalothrin 50g/kg	Kaiso 50WG Lavron®50WG	contact	25 – 30g		NZ _T		✓			✓	✓					Cyhella are registered for use on turf. AGPRO Lambda Cyhalothrin is a 6.1B substance.
Lambda-cyhalothrin 250g/L	AGPRO Lambda Cyhalothrin Cyhella™ Karate® Zeon	contact	5 - 6ml		NZ _T		✓			NZ _T	✓				NZ _T	

Pest Control				Target										Comments		
Active ingredient	Trade names	Activity	Rate (per 1340m ² green)	Black beetle larvae	Black beetle adult	Cotula weevil larvae	Cotula weevil adults	Earthworms	Grass grub larvae	Grass grub adults	Greasy cutworm	Mealy bug	Nematodes	Porina	Sod web worm	
Triterpene saponin	Early Bird™ Liquid 3-0-0	contact	5.4 – 6.4L					✓								Most effective when applied with a high water rate, (100-150L), when the surface is wet and earthworms are close to the surface.
	Cast Off	contact	5.4L					✓								
	Tee-off granules	contact	47Kg					✓								For best results apply before rain or wash in with 6–10mm water applied as short pulses. This product brings earthworms to the surface. NZSTI research (2015) shows comparable results can be achieved using Early Bird & Cast Off when applied at ½ rates.
	TS granules	contact	27 – 41Kg					✓								



NZ • SPORTS • TURF

INSTITUTE

SPECIALISTS IN NATURAL & SYNTHETIC TURF

AUCKLAND

C/- Maungakiekie Golf Club,
P.O. Box 27 074 Mt Roskill
Auckland 1440
Ph (09) 415 0308
Mob 027 232 4545

HAMILTON

154 Rimu Street, Maeroa
Hamilton 3200
Ph (07) 846 7698
Mob 027 442 8053

DUNEDIN

130 Anzac Ave
Dunedin 9016
PO Box 6289 Dunedin North
Dunedin 9059
Ph (03) 477 7333
Mob 027 446 2875

PALMERSTON NORTH

163 Old West Road
Palmerston North 4474
PO Box 347
Palmerston North 4440
Ph (06) 356 8090
Mob 027 442 8046
Email: turf@nzsti.org.nz

CHRISTCHURCH

455 Blenheim Road, Sockburn
Christchurch 8042
PO Box 14-207
Christchurch Airport 8544
Ph (03) 343 8966
Mob 027 552 4488

NZSTI LABORATORIES

Email: turf@nzsti.org.nz

www.nzsti.org.nz