# B. Chemicals that may be useful in rotation to reduce resistance

# DEPENDING ON VALID, REGISTRATIONS, PERMITS, OR EXEPTIONS THAT APPLY

# Some of the permits/registrations listed here may already be invalid due to review outcomes

### Western Flower Thrips

- Capsicums
- Cucumbers

### Greenhouse Whitefly

- Capsicums
- Cucumbers

### Two Spotted Mites (Spider Mites)

- Capsicums
- Cucumbers

# **Western flower Thrips**

# **CAPSICUMS**

Western Flower Thrips  Add later: Image of Life cycle as per web page, noting time between life stages, total life span and stages not killed by contact							
	AVAILABLE CHEMICALS: reg, permit, (Note re exemptions later)						
Example brand names							
Supracide (Syngenta)	Methidathion	Group 1B	PER7837, expires 30/9/07	2L/ha get /100mL	WHP 7 days, max 3 sprays/crop		
Lannate/Marlin (Crop Methomyl Group 1A PER7836, expires 30/9/07 2L/ha get /100mL, glasshouse? WHP 1 day, mages glasshouse?				WHP 1 day, max 3 sprays/crop			
Success (Dow)							
Vertimec (Syngenta)	Abamectin	Group 6A	oup 6A no permits for capsicums PER7833 Cucumber, to 30/9/08				
Endosulfan (Farmoz)	Endosulfan	Group 2A	PER8321, expires 30/9/08	190mL/100mL	WHP 7 days, max 2 sprays/crop		

### CUCUMBERS

			CCCCMIDEN				
			Western Flower Thr	ips			
	Add later: Imag	ge of Life cycle as	per web page, noting time between life	stages, total life span and sta	ages not killed by contact		
	AVAILABLE CHEMICALS: reg, permit, (Note re exemptions later)						
Example brand name							
Supracide (Syngenta)	Methidathion	Group 1B	no permits for cucumbers	PER7837 Capsicum, to 30/9/07			
Lannate/Marlin (Crop Care/Bayer)	Methomyl	Group 1A	PER7836, expires 30/9/07	2L/ha get /100mL	WHP 1 day, max 3 sprays/crop		
Success (Dow)	Spinosad	Group 5A	PER6793, expires 30/3/06	80mL/100mL	WHP 1 day, avoid stock grazing on treated crop/waste		
Vertimec (Syngenta)	Abamectin	Group 6A	PER7833, expires 30/9/08	90mL/100mL	WHP 3 days, max 2 sprays/crop		
Endosulfan (Farmoz)	Endosulfan	Group 2A	PER8321, expires 30/9/08	190mL/100mL	WHP 7 days, max 2 sprays/crop		

# **Greenhouse Whitefly**

# **CAPSICUMS**

	Add later: In		Whitefly (Greenhouse whitefle as per web page, noting time between li	fe stages, total life span and s	stages not killed by contact		
AVAILABLE CHEMICALS: reg, permit, (Note re exemptions later)							
Example brand names	Active constituent	Chemical group	Registration or Permit No and Dates	Rate (Low volume only)	Standout comments		
Lannate/Marlin	Methomyl	Group 1A	no current permits	PER7836 Capsicum, WFT to 31/12/07			
Confidor (Bayer)	Imidacloprid	Group 4A	no current permits	PER7815 Cucumber, to 30/11/07 PER5735 Brassicas, to 28/2/08			
Ambush (AgNova)	Permethrin	Group 3A	no current permits, NRA 48193/0503				
Applaud (Dow)	Buprofezin	Group 17A	no current permits	PER7627 Cucumber.eggplant, SL whitefly, to 31/3/06, QLD, WA & NT only			
Chess (Syngenta)	Pymetrozine	Group 9A	no current permits	PER7629 Cucumber to 31/3/06, SL whitefly, NSW, QLD, NT & WA only			
Admiral/Knack (Sumitomo)	Pyriproxyfen	can't find	no current permits	PER7628 Cucumber,eggplant, to 30/3/06, SL whitefly, QLD, WA & NT only			
Bulldock (Bayer)	Betacyfluthrin	Group 3A	PER7356, expires 31/7/08				
D-C-tron Oil	Petroleum oil	Pest oil	no current permits in SA	PER8249 Capsicum, to 31/3/10	), QLD, WA &NT only		

### **CUCUMBERS**

			COCONIDE			
	Add later: Ir		Whitefly (Silverleaf whitefly, Greas per web page, noting time between li	fe stages, total life span and s	stages not killed by contact	
		$A^{\circ}$	VAILABLE CHEMICALS: reg, permit, (	(Note re exemptions later)		
Example brand names	Active constituent	Chemical group	Registration or Permit No and Dates	Rate (Low volume only)	Standout comments	
Lannate/Marlin	Methomyl	Group 1A	no permits	PER7836 WFT, to 30/9/07		
Confidor (Bayer)	Imidacloprid	Group 4A	PER7815, expires30/11/07	25mL/100mL WHP 1 day		
Ambush (AgNova)	Permethrin	Group 3A	no current permits, NRA 48193/0503	PER8765 Cucumber, cucumber	r moth larvae, WA only	
Applaud (Dow)	Buprofezin	Group 17A	no permits in SA	PER7627 Cucumber, SL whitefly, to 31/3/06, QLD, WA & NT only		
Chess (Syngenta)	Pymetrozine	Group 9A	no permits in SA	PER7629 Cucumber, SL whitefly, to 31/3/06, NSW, QLD, WA & NT only		
Admiral/Knack (Sumitomo)	Pyriproxyfen	can't find	no permits in SA	PER7628 Cucumber, SL whitefly, to 31/3/06, QLD, WA & NT only		
Bulldock (Bayer)	Betacyfluthrin	Group 3A	no permits for cucumbers	mbers PER7356 Capsicum, to 31/7/08		
D-C-tron Oil	Petroleum oil	Pest oil	no permits in SA	PER8249 Capsicum, to 31/3/10, QLD, WA &NT only		

# **Two Spotted Mites**

# **CAPSICUMS**

			Mites (red spider/two spotted mites, b	oroad mites)		
		AVAII	LABLE CHEMICALS: reg, permit, (Note	re exemptions later)		
Example brand names	Active constituent	Chemical group	Registration or Permit No and Dates	Rate (Low volume only)	Standout comments	
Vertimec (Syngenta)  Abamectin  Group 6A  permit expired 2003  PER7355 Cucumber, zucchini, TSM, to 31/3/07  PER6650 Eggplant, TSM, to 16/8/08						
Kelthane (Crop Care)	Dicofol	Group 2B	no current permits, NRA 48201/1000	PER7282 Passionfruit, Passionfruit mite, to 30/3/06 NSW, QLD only		
Omite (Crompton)	Propargite	Group 14A	no current permits, NRA 48086/0702			
Acramite (Crompton)	Bifenazate	Group 2D	no permits ever issued, no NRA			
Masta-mite (Crompton)	Dicofol/Tetradifon	Group 2B	no permits ever issued, no NRA			
Morestan (Bayer) Oxythioquinox Group X no permits ever issued, NRA 33992/0704						
Talstar (FMC)	Bifen*thrin	Group 3A	PER8331, expires 31/3/06	40mL/100mL	harvest after 1 day	

## **CUCUMBERS**

Example brand name	Standout comments
Vertimec (Syngenta)	WHP 3 days, max 2 sprays/crop
Kelthane (Crop Care)	fruit mite, to 30/3/06 NSW, QLD only
Omite (Crompton)	
Acramite (Crompton)	
Masta-mite (Crompton)	
Morestan (Bayer)	
Calstar (FMC)	5
Morestan (Bayer)	5

# C. Key insecticide properties

- \* Note: Please seek additional advice to confirm any decision prompted by information contained here because:
  - Not all risks and benefits are fully covered
  - This list does not rate resistance levels
  - Impact on beneficial insects is noted in some cases
  - Pesticide group is noted in the list above

### Chemicals summarised and pest targets

ACTIVE	EXAMPLE TRADE	PEST TARGETS INCLUDED
CONSTITUENT	NAME	
Spinosad	Success/Naturalyte	Various pests: including thrips and whitefly
Methamidaphos	Nitofol	Various pests: including thrips, whitefly and
		mites
Natural pyrethrin	Py Bo	Various pests: including thrips, whitefly and
		mites
Methomyl	Lannate	Various pests: including thrips and whitefly
Pymetrozine	Chess	whitefly, aphids
Methidathion	Supracide	Thrips
Endosulfan	Endosulfan/Thiodan	Thrips
Imidacloprid	Confidor	Whitefly
Beta-cyfluthrin	Bulldock	Whitefly
Kelthane	Dicofol	Mites
Oxythioquinox	Morestan	Mites
Abamectin	Vertimec	Mites
Abamectin	Agrimec	Mites
Bifenthrin	Talstar	Mites
Propargite	Omite	Mites
Permethrin	Ambush	Mites

### Chemicals to be added to the review

Admiral   Whi	tefly
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C 1	N-41-4	A -4:0			
Common brand name: St		Active constituent: Spinosad – various pests			
For details of any current permit or i	egistration:	Compatability with beneficial insects: Safe to predatory insects, mites and spiders. May temporarily			
Please see attached notes.			opulations. Avoid dii	rect application to bees. Once dried will not harm	
Please check for recent changes to pe	rmits on the APVMA web	foraging bees.			
site: http://www.apvma.gov.au			T		
Mode of action: Contact, ingestion	Life stages impacted: nympl		Time to kill: Resu	lts observed 1-3 days	
and ovicidal-like activity.		per larvae will not be controlled.			
Coverage notes:	Resistance management;	Use of oils and adjuvants:	Compatibility	Breakdown sensitive to:	
Good coverage of insect feeding	DO NOT APPLY MORE	Some crops suggest use of a	for mixing (with	1. pH: Use only clean water, pH 5-9	
sites is essential as Spinosad is	THAN 4 TIMES PER	non ionic wetter, i.e. for waxy	fungicides	2. High salinity: currently making enquiries.	
non-systemic.	CROP.	surfaces like Brassica leaves.	fertilisers, trace	Any more specific details on that?	
	Do not use lower than label		elements etc.)	3. Temperature: Above 24deg., but insects	
Apply min volume of 250L/ha and	rates.	Oils certainly help penetration		may hide if too hot. (not over 28 deg. for	
increase spray volume as crop	For WFT: use 3	if chasing leafminers.	Can use with	aerial spray-drying out > not sticking)	
grows. Use nozzles that give	consecutive sprays only, 3-		wetting agents.	4. Low humidity: ?	
droplets in the size range of 150-	5 days apart when		???? no	5. UV light: rapid breakdown so re-	
200 microns. High water volumes	temp>20deg & 6-12 days		information	infestations can occur and establish rapidly	
definitely help.	apart when temp <20deg.			(can look like spray failures). Store and mix	
	For further control switch			product out of direct sunlight.	
Can add wetting agent to improve	to approved product from				
coverage.	another chemical group.				
Ensure spray dries completely before	Ensure chemical rotation				
rain.	partners are also effective				
Repeat applications 7-14 days as new	against target pest.				
infestations occur.					
Witholding period 3 days in most					
cases.					

### **Key notes on usage:**

- To minimise UV breakdown and get maximum contact with pest insects best to apply late in the day/early morning on warm days
- Old product may suffer from settling out (as with all SCs). Needs to be stirred thoroughly to re-suspend bottom sediment if this has occurred.

Common brand name: Nitofol®		Active constituent: Methamidophos –various pests			
For details of any current permit or registration:		Compatability with beneficial insects: Direct application is highly toxic to all beneficial insects,			
Please see attached notes.		invertebrates, birds, mamm	als and humans.		
Please check for recent changes to p	permits on the APVMA web				
site: http://www.apvma.gov.au					
<b>Mode of action: Systemic</b>	Life stages impacted: Eggs, n		Time to kill: On contact	or ingestion ?	
insecticide with contact and	of contact and systemic action.	?			
digestive action.? Inhibits nervous					
system.					
Coverage notes:	Resistance management:	Use of oils and	Compatibility for	Breakdown sensitive to:	
		adjuvants:	mixing (with	1. pH: ?	
Good coverage is essential. Apply	For WFT: use 3 consecutive		fungicides fertilisers,	2. High salinity: ?	
as a full cover spray.	sprays only, up to 5 days	Some crops suggest use	trace elements etc.)	3. Temperature: ?	
Do not use at higher concentrations	apart. For further control	of a wetter, i.e. for waxy		4. Low humidity: ?	
than recommended for crop.	switch to approved product	surfaces like Brassica	Compatible with	5. UV light: Do not store in sunlight.	
	from another chemical group.	leaves.	Antracol®, Bulldock®,		
Highly hazardous on contact but			Folimat® and Fruvit®		
breaks down rapidly.	Do not use lower than label				
	rates as this will speed up		DO NOT MIX		
DO NOT USE IN GLASSHOUSES	selection for resistance.		CONCENTRATES.		
OR ENCLOSED SPACES.					
*****	Ensure chemical rotation				
Witholding period for workers 1	partners are also effective				
day after spraying. Variable harvest	against target pest.				
witholding periods, see product					
label for specific crops.					
Warran Ann an ann ann					

- Key notes on usage:
   Prior to pouring shake container vigorously.
   To minimise UV breakdown and get maximum contact with pest insects best to apply late in the day/early morning on warm days

Common brand	name: Py-Bo®	Active constituent: Natural Pyrethrum – whitefly, thrips, aphids			
For details of any current perm	it or registration:	Compatability with beneficia	l insects: Harmful on con	tact to beneficials. Spray in the evening to avoid	
Please see attached notes.	b	bees and wasps which forage d	uring the day.		
Please check for recent changes	to permits on the APVMA				
web site: http://www.apvma.gov.	<u>.au</u>				
Mode of action: Contact.	Life stages impacted: Contact wi	rith target insect - any life	Time to kill: Instant pa	ralysis and death	
	stage?				
Coverage notes:	Resistance management:	Use of oils and	Compatibility for	Breakdown sensitive to:	
		adjuvants:	mixing (with	1. pH: Stable at pH5-9	
Thorough coverage including	No known problems!		fungicides fertilisers,	2. High salinity: ?	
under surfaces is essential. Can		Mixed with	trace elements etc.)	3. Temperature: ?	
be sprayed, fogged and misted.	Do not use lower than label rates	480g/Lpiperonyl butoxide		4. Low humidity: ?	
	as this will speed up selection for	1:6 synergist ratio	Mix with fungicides	5. UV light: Very rapid breakdown in UV	
	resistance.		and foliar fertilizers	light	
	Ensure chemical rotation partners are also effective against target	3			
pest.					
Key notes on usage:  To minimise UV breakdown	and get maximum contact with per	est insects best to apply very la	te in the day, even at nigi	ht if warm	

Common brand name: Lanna	Active constituer	Active constituent: Methomyl – whitefly & Western Flower Thrips		
For details of any current permit or registrat	Compatability with ben	Compatability with beneficial insects: Direct application is highly toxic to all beneficial insects,		
Please see attached notes.		invertebrates, birds, mam	mals and humans.	
Please check for recent changes to permits on				
http://www.apvma.gov.au				
<b>Mode of action:</b> Systemic insecticide with	Life stages impacted: Eg	ggs, nymphs and adults	Time to kill: on contact	et or ingestion
contact and digestive action. Inhibits nervous	because of contact and sy	stemic action.		
system.				
Coverage notes:	Resistance	Use of oils and		Breakdown sensitive to:
DO NOT APPLY AS FOG OR MIST.	management:	adjuvants:	mixing (with	1. pH: ?
DO NOT USE IN GLASSHOUSES OR			fungicides fertilisers,	2. High salinity: Water hardness and
ENCLOSED SPACES.	Do not use lower than	For optimum results	1	electrolytes can be a problem – emulsifier
Best applied to young insects.	label rates as this will	add non-ionic wetting		agglomerates.
Good coverage essential.	speed up selection for	agent at 0.025% (eg		3. Temperature:
	resistance.	25mL/100L).	CONCENTRATES.	4. Low humidity: ?
Highly hazardous to all on contact but breaks			Do not mix more than	5. UV light: Mix and spray promptly.
down rapidly.	Ensure chemical		2 products.	
	rotation partners are			
	also effective against			
Key notes on usage:	target pest.			

### **Key notes on usage:**

- Agitation required to fully mix insecticides. Noted more problems in times of drought. Water hardness increases and more mixing of additives by growers
- To minimise UV breakdown and get maximum contact with pest insects best to apply late in the day/early morning on warm days

Common brand name: Chess®		Active constituent: Pymetrozine - whitefly, aphids				
For details of any current permit or registration:		Compatability with benef	icial insects: ?			
Please see attached notes.						
Please check for recent changes to	permits on the APVMA web					
site: http://www.apvma.gov.au						
Mode of action: Contact and	Life stages impacted: Adults a	and nymphs.	Time to kill: ?			
digestive action ?.						
Coverage notes:	Resistance management:	Use of oils and	Compatibility for	Breakdown sensitive to:		
Thorough coverage and penetration	Do not apply more than 2	adjuvants:	mixing (with	1. pH: ?		
into canopy is essential.	sprays per crop. Do not apply	Suggest use of a wetter	fungicides fertilisers,	2. High salinity: ?		
	consecutive sprays.	for waxy surfaces like	trace elements etc.)	3. Temperature: ?		
Do not apply if rain is expected		Brassica leaves.		4. Low humidity: ?		
within 6 hours.	Do not use lower than label		?	5. UV light: Do not store in sunlight.		
	rates as this will speed up					
Variable harvest witholding	selection for resistance.		DO NOT MIX			
periods, see product label for			CONCENTRATES.			
specific crop.	Ensure chemical rotation					
	partners are also effective					
	against target pest.					
Key notes on usage:	ı	'	1	'		
To minimise UV breakdown and	get maximum contact with pest	insects best to apply late in	the day/early morning on	warm days		

Common brand name: Supracide®		Active constituent: Methidathion - Western flower thrips			
For details of any current permit or	r registration:			bees. Do not apply when bees are foraging.	
Please see attached notes.		Harmful to beneficial insect	ts and not suitable for IPM	programs.	
Please check for recent changes to p	permits on the APVMA web				
site: http://www.apvma.gov.au					
Mode of action: Contact and	Life stages impacted: Eggs ?,	adults and nymphs.	Time to kill: ?		
digestive action. Attacks nervous					
system ?.					
Coverage notes:	Resistance management:	Use of oils and	Compatibility for	Breakdown sensitive to:	
Thorough coverage and penetration	WFT details ?	adjuvants:	mixing (with	1. pH: ?	
into canopy is essential.	Do not use lower than label	Suggest use of a non-	fungicides fertilisers,	2. High salinity: ?	
	rates as this will speed up	ionic surfactant wetter,	trace elements etc.)	3. Temperature: ?	
Do not apply if rain is expected	selection for resistance.	for waxy surfaces like		4. Low humidity: ?	
within 6 hours.		Brassica leaves.	?	5. UV light: Do not store in sunlight.	
	Ensure chemical rotation	DO NOT MIX			
Variable harvest witholding	partners are also effective	SUPRACIDE® WITH	DO NOT MIX		
periods, see product label for	against target pest.	OILS ON CITRUS.	CONCENTRATES.		
specific crop.					
Key notes on usage:					

Common brand name: T	hiodan®, Endosulfan	Active co	nstituent: Endosulf	an – Western flower thrips		
For details of any current permit or	r registration:	<b>Compatability with beneficial insects:</b> Dangerous to bees. Do not apply when bees are foraging.				
Please see attached notes.						
Please check for recent changes to j	permits on the APVMA web					
site: http://www.apvma.gov.au						
<b>Mode of action:</b> Contact and by	Life stages impacted: Adults a	and nymphs.	Time to kill: ?			
digestion.						
Coverage notes:	Resistance management:	Use of oils and	Compatibility for	Breakdown sensitive to:		
		adjuvants:	mixing (with fungicides	1. pH: ?		
Records of sprays must be kept	Apply 2 consecutive sprays		fertilisers, trace elements	2. High salinity: ?		
according to label specifications.	only and do not apply more		etc.)	3. Temperature: ?		
Only apply when temperature, wind	than 2 sprays in total per	Not permitted for use	DO 1107	4. Low humidity: ?		
and humidity are favourable. Do not	crop. Apply sprays 3 days	on Brassicas. ?	DO NOT MIX	5. UV light: Do not store in sunlight.		
apply when temperature inversion	apart if 20 deg or higher, and	DO NOT LIGH	CONCENTRATES.			
conditions exist.	6 days apart if temperature is	DO NOT USE				
DO NOT ADDIN IT DAIN IT	below 20 deg.	ADDITIONAL	Can be mixed with			
DO NOT APPLY IF RAIN IS EXPECTED WITHIN 2 DAYS.	Do not use lower than label	ADJUVANTS.	Thiram®, Ziram® and			
DO NOT IRRIGATE FOR AT			copper oxychloride. Do not mix endosulfan with			
LEAST 2 DAYS AFTER	rates as this will speed up selection for resistance.		more than one of these			
SPRAYING.	selection for resistance.		products. Avoid mixing			
SPRATING.	Ensure chemical rotation		with alkaline solutions.			
DO NOT APPLY TO ENCLOSED	partners are also effective		with arkanne solutions.			
CROPS (eg glasshouses).	against target pest.					
For most crops a limit of 2 sprays is	agamst target pest.					
permitted.						
permitted.						
Thorough coverage and penetration						
into canopy is essential.						
Variable harvest witholding						
periods, see product label for						
specific crop.						
<b>T</b> 7		J	l			

### **Key notes on usage:**

- To minimise UV breakdown and get maximum contact with pest insects best to apply late in the day/early morning on warm days
- Refer closely to label specifications for record keeping regulations and limits to spray conditions.

Common brand name: Applaud®		Active constituent: Buprofezin - Whitefly specific			
For details of any current permit or registration:		Compatability with beneficial insects: Safe to bees, predatory insects, mites and spiders. May be			
Please see attached notes.		toxic to predatory ladybe	etle eggs and larvae.		
Please check for recent changes to p	permits on the APVMA web				
site: <a href="http://www.apvma.gov.au">http://www.apvma.gov.au</a>					
Mode of action: Persistent	<b>Life stages impacted:</b> Inhibits		<b>Time to kill:</b> Slow since it	inhibits moulting. Adults not affected greatly	
insecticide/acaricide with contact	larvae. Suppresses oviposition b	by adults and adults lay			
and digestive action. Stops	sterile eggs.				
moulting. Not translocated					
Coverage notes:	Resistance management:	Use of oils and	Compatibility for	Breakdown sensitive to:	
Use sufficient water to ensure	DO NOT USE MORE THAN	adjuvants:	<b>mixing</b> (with fungicides	1. pH- Stable in acidic and alkaline media	
complete wetting of all surfaces.	2 SPRAYS PER SEASON	Do not mix with pest	fertilisers, trace elements	2. High salinity: ?	
		oils.	etc.)	3. Temperature: Stable	
DO NOT APPLY if heavy rain is	Do not use lower than label		Compatible with most	4. Low humidity: ?	
imminent.	rates as this will speed up		commonly used	5. UV light: Stable but do not store in direct	
	selection for resistance.		Insecticides and	sunlight.	
Witholding period until spray has			Fungicides.		
dried. For harvest witholding	Ensure chemical rotation		DO NOT USE with		
periods see product label for	partners are also effective		highly alkaline or highly		
specific crop.	against target pest.		acidic products.		

- Key notes on usage:

   Do not store in direct sunlight. Do not apply by air.

   To minimise UV breakdown and get maximum contact with pest insects best to apply late in the day/early morning on warm days

Common brand name: Confidor®		Active constituent: Imidacloprid - whitefly			
For details of any current permit or	r registration:	Compatability with beneficial insects: Do not spray any plants while bees are foraging			
Please see attached notes.					
Please check for recent changes to p	Please check for recent changes to permits on the APVMA web				
site: <a href="http://www.apvma.gov.au">http://www.apvma.gov.au</a>					
Mode of action: Systemic	Life stages impacted: Adults a	and nymphs because of	Time to kill: On contac	t or ingestion	
insecticide with contact and	contact and systemic action.				
digestive action.					
Good root-systemic action.				<u>_</u>	
Coverage notes:	Resistance management:	Use of oils and		Breakdown sensitive to:	
		adjuvants:	mixing (with	1. pH: Stable at pH 5-11	
Apply as a full cover spray. For	Annuals: Do not apply more		fungicides fertilisers,	2. High salinity: ?	
whitefly ensure underside of leaves	than one spray. Perennials:	In cotton recommended to	trace elements etc.)	3. Temperature:	
are sprayed.	Use a max of 3 sprays per	use Pulse Penetrant		4. Low humidity: ?	
	year and rotate with other		Compatible with	5. UV light: Do not store in sunlight.	
Can be applied as a foliar spray or	chemicals		Antracol®, Baycor®,		
soil drench.			or Nitofol®.		
	Do not use lower than label				
Variable harvest witholding	rates as this will speed up		DO NOT MIX		
periods, see product label for	selection for resistance.		CONCENTRATES.		
specific crops.					
	Ensure chemical rotation				
	partners are also effective				
	against target pest.				

- Key notes on usage:

  Prior to pouring shake container vigorously.

  To minimise UV breakdown and get maximum contact with pest insects best to apply late in the day/early morning on warm days

Common brand name: Bulldock 25 EC®  For details of any current permit or registration:		Active constituent: Beta-cyfluthrin - whitefly Compatability with beneficial insects: Dangerous to bees. Do not apply when bees are foraging.				
Please check for recent changes to j	permits on the APVMA web					
site: http://www.apvma.gov.au						
Mode of action: Contact (not	Life stages impacted: Adults	and nymphs.	Time to kill: ?			
systemic).						
Coverage notes:	Resistance management:	Use of oils and	Compatibility for	Breakdown sensitive to:		
Thorough coverage and penetration		adjuvants:	mixing (with	1. pH: ?		
into canopy is essential.	Do not use lower than label	Some crops suggest use	fungicides fertilisers,	2. High salinity: ?		
Do not apply if rain is expected	rates as this will speed up	of a wetter, i.e. for waxy	trace elements etc.)	3. Temperature: ?		
within 6 hours.	selection for resistance.	surfaces like Brassica		4. Low humidity: ?		
Variable harvest witholding		leaves.	Compatible with most	5. UV light: Do not store in sunlight.		
periods, (1 to 7 days), see product	Ensure chemical rotation		common fungicides			
label for specific crop.	partners are also effective		and herbicides.			
	against target pest.					
			DO NOT MIX			
			CONCENTRATES.			
Key notes on usage:						
■ To minimise UV breakdown and	get maximum contact with pest	t insects best to apply late in	the day/early morning on	warm days		

Please see attached notes. Please see attached notes. Please see attached notes. Please check for recent changes to permits on the APVMA web site: http://www.apvma.gov.au  Mode of action: Systemic insecticide with contact and digestive action.?  Coverage notes:  Apply as a full cover spray.  Annuals: Do not apply more than one spray. Perennials: Use a max of 3 sprays per year and rotate with other specific crops.  Do not use lower than label rates as this will speed up selection for resistance.  Ensure chemical rotation partners are also effective against target pest.  Compatibility with beneficial insects: Low hazard to bees. May be applied at any time.  Please see attached notes.  Compatibility with beneficial insects: Low hazard to bees. May be applied at any time.  Please check for recent changes to permits on the APVMA web site:  Life stages impacted: Adults and nymphs because of contact and systemic action.?  Time to kill: On contact or ingestion?  Time to kill: On contact or ingestion?  Time to kill: On contact or ingestion?    Do mixing (with fungicides fertilisers, trace elements etc.)	Common brand name: Kelthane®		Active constituent: Dicofol - mites					
Please check for recent changes to site: <a href="http://www.apvma.gov.au">http://www.apvma.gov.au</a> Mode of action: Systemic insecticide with contact and digestive action.?  Coverage notes:  Apply as a full cover spray.  Annuals: Do not apply more than one spray. Perennials: Use a max of 3 sprays per year and rotate with other specific crops.  Do not use lower than label rates as this will speed up selection for resistance.  Do not use lower than label rates as this will speed up selection for resistance.  Ensure chemical rotation partners are also effective  Please check for recent changes by site; <a href="http://www.apvma.gov.au">http://www.apvma.gov.au</a> Time to kill: On contact or ingestion?  To peral down sensitive to:  1. pH: Hydrolyses at pH>7  Compatible servation;  To poperature: Sensitive to heat  4. Low humidity: ?  To not mix with  Bordeaux mixture, lime, zinc sulphate or carbaryl or highly alkaline substances.  Final down sensitive to:  1. pH: Hydrolyses at pH>7  Compatible with most fungicides.  Do not mix with  Bordeaux mixture, lime, zinc sulphate or carbaryl or highly alkaline substances.	For details of any current permit or	For details of any current permit or registration:		Compatability with beneficial insects: Low hazard to bees. May be applied at any time.				
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Mode of action: Systemic insecticide with contact and digestive action.?       Life stages impacted: Adults and nymphs because of contact and systemic action.?       Time to kill: On contact or ingestion?         Coverage notes:       Resistance management:       Use of oils and adjuvants:       Compatibility for mixing (with fungicides fertilisers, trace elements etc.)       High salinity: ?         Apply as a full cover spray.       Annuals: Do not apply more than one spray. Perennials: Use a max of 3 sprays per year and rotate with other chemicals       Can add wetting agent (Agral® recommended).       Compatible with most fungicides.       Life tages impacted: Adults and nymphs because of contact and systemic action.?       Ensure chemical rotation partners are also effective       Use of oils and adjuvants:       Compatibility for mixing (with fungicides fertilisers, trace elements etc.)       1. pH: Hydrolyses at pH>7       2. High salinity: ?       2. High salinity: ?       5. UV light: Do not store in sunlight.       5. UV light: Do not store in sunlight.       5. UV light: Do not store in sunlight.       4. Low humidity: ?       5. UV light: Do not store in sunlight.       5. UV light: Do not store in sunlight.       4. Low humidity: ?       5. UV light: Do not store in sunlight.       4. Low humidity: ?       5. UV light: Do not store in sunlight.       5. UV light: Do not store in sunlight.       5. UV light: Do not store in sunlight.       6. UV light: Do not store in sunlight.       6. UV light: Do not store in sunlight.       6. UV light: Do not s		permits on the APVMA web						
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Variable harvest periods, see product specific crops.  than one spray. Perennials: Use a max of 3 sprays per year and rotate with other chemicals  Do not use lower than label rates as this will speed up selection for resistance.  Do not use lower than label rates as this will speed up selection for resistance.  Ensure chemical rotation partners are also effective  Can add wetting agent (Agral® recommended).  Can add wetting agent (Agral® recommended).  Can add wetting agent (Agral® recommended).  Do not mix with Bordeaux mixture, lime, zinc sulphate or carbaryl or highly alkaline substances.			adjuvants:	0 .	1. pH: Hydrolyses at pH>7			
Variable harvest witholding periods, see product specific crops.  Use a max of 3 sprays per year and rotate with other chemicals  Do not use lower than label rates as this will speed up selection for resistance.  Do not mix with Bordeaux mixture, lime, zinc sulphate or carbaryl or highly alkaline substances.  4. Low humidity: ?  5. UV light: Do not store in sunlight.  How humidity: ?  To not mix with Bordeaux mixture, lime, zinc sulphate or carbaryl or highly alkaline substances.	Apply as a full cover spray.	11 0			2. High salinity: ?			
periods, see product label for specific crops.    Do not use lower than label rates as this will speed up selection for resistance.   Ensure chemical rotation partners are also effective   Do not use lower than label rates as this will speed up selection for resistance.   Sometime with most fungicides.				trace elements etc.)	3. Temperature: Sensitive to heat			
specific crops.  Chemicals  Do not use lower than label rates as this will speed up selection for resistance.  Ensure chemical rotation partners are also effective  fungicides.  Do not mix with Bordeaux mixture, lime, zinc sulphate or carbaryl or highly alkaline substances.	Variable harvest witholding		(Agral® recommended).		4. Low humidity: ?			
Do not use lower than label rates as this will speed up selection for resistance.  Ensure chemical rotation partners are also effective  Do not mix with Bordeaux mixture, lime, zinc sulphate or carbaryl or highly alkaline substances.		1 7		_	5. UV light: Do not store in sunlight.			
rates as this will speed up selection for resistance.  Ensure chemical rotation partners are also effective  Bordeaux mixture, lime, zinc sulphate or carbaryl or highly alkaline substances.	specific crops.	chemicals		fungicides.				
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Ensure chemical rotation partners are also effective carbaryl or highly alkaline substances.				I				
Ensure chemical rotation partners are also effective alkaline substances.		selection for resistance.		lime, zinc sulphate or				
partners are also effective								
				alkaline substances.				
against target pest.		=						
		against target pest.						

Common brand name: Morestan®		Active constituent: Oxythioquinox - mites			
Mode of action: ?		Life stages impacted: Adults a	and nymphs.	ime to kill: ?	
For details of any current permit or registration: Please see attached notes. Please check for recent changes to permits on the APVMA web site: <a href="http://www.apvma.gov.au">http://www.apvma.gov.au</a>		Compatability with beneficial insects: Limit spraying particularly of fruit trees to allow activity of predatory mites			
Coverage notes:  Thorough coverage and penetration into canopy is essential.  Spraying during high temperatures may cause sunburn blemishes on fruit.	Resistance management:  Apply early when mites are building up.  Do not use lower than label rates as this will speed up selection for resistance.  Ensure chemical rotation partners are also effective against target pest.	Use of oils and adjuvants:  Do not apply 2 weeks before or 3 weeks after application of an oil spray.	Compatibility for mixing (with fungicides fertiliser: trace elements etc.)  Best to apply alone. Do not mix with strongly alkaline substances.  DO NOT MIX WIT OTHER  CONCENTRATES	<ul> <li>3. Temperature: Do not apply if temperature higher than 30deg.</li> <li>4. Low humidity: ?</li> <li>5. UV light: Do not store in sunlight.</li> </ul>	
Vay notes on usage:					

Common brand name: Vertimec®		Active con	Active constituent: Abamectin – two spotted mites			
Mode of action: Contact and digestive action. Has limited		Life stages impacted: Adults a	and nymphs.	Time to kill: Up to 7 days		
systemic activity but exhibi	ts translaminar movement					
For details of any current	permit or registration:	Compatability with beneficial	l insects: Do not apply w	hen bees are foraging. Safe to non-feeding insects.		
Please see attached notes.						
Please check for recent ch	anges to permits on the APVMA					
web site: http://www.apvm	a.gov.au					
Coverage notes:	Resistance management:	Use of oils and adjuvants:	Compatibility for	Breakdown sensitive to:		
			mixing (with	1. pH: Stable at pH5-9		
Do not apply with	Do not apply more than 2 sprays if	Do not apply to apples or	fungicides fertilisers,	2. High salinity: ?		
equipment that may leave	mites are present per crop.	pears before or after Delan®	trace elements etc.)	3. Temperature: stable up to 25°C, Do not		
large droplets. Thorough	Vertimec® should not be applied in	or Captan® Use precautions		apply when temp exceed 28° or are expected		
coverage and penetration	2 consecutive seasons without an	when applying with summer		to exceed 28°C within 48 hrs after		
into canopy is essential.	unrelated chemical being used	oil		application		
Do not apply when				4. Low humidity: ?		
temperatures above	Do not use lower than label rates as			5. UV light: Do not store in sunlight.		
28deg.	this will speed up selection for			6. Vertimec® that is not absorbed into plants		
	resistance.			is quickly degraded. Allow at least 28 days		
				between applications		
	Ensure chemical rotation partners					
Key notes on usage:	are also effective against target pest.					

Common brand name: Agrimec® Active co		onstituent: Abamectin – two spotted mites					
For details of any current permi	t or registration:	Compa	tabil	ity wit	h benef	icial insects: Do not appl	y when bees are foraging. Safe to non-feeding
Please see attached notes.		insects.				•	
Please check for recent changes to permits on the APVMA web							
site: http://www.apvma.gov.au							
Mode of action: Contact and	Life stages impacted: Adults	and nymp	hs.			<b>Time to kill:</b> Up to 7 da	nys.
digestive action.							
Coverage notes:	Resistance management:	Use	of	oils	and	Compatibility for	Breakdown sensitive to:
		adjuva	nts:			mixing (with	1. pH: ?
AS FOR VERTIMEC ?	Do not use lower than label					fungicides fertilisers,	2. High salinity: ?
	rates as this will speed up					trace elements etc.)	3. Temperature: ?
	selection for resistance.						4. Low humidity: ?
							5. UV light: Do not store in sunlight.
	Ensure chemical rotation						
	partners are also effective						
	against target pest.						
Key notes on usage:				•			

To minimise UV breakdown and get maximum contact with pest insects best to apply late in the day/early morning on warm days

Common brand name: Talstar 100 EC®		Active constituent: Bifenthrin – mites				
For details of any current permit or registration:		Compatability with benef	icial insects: Dangerous to	bees. Do not apply when bees are foraging. Not		
Please see attached notes.		suitable for IPM programs	where predatory mites and	other insect predators are providing effective pest		
Please check for recent changes to	permits on the APVMA web	control.				
site: http://www.apvma.gov.au						
Mode of action: Contact and	Life stages impacted: Adults a	and nymphs.	Time to kill: ?			
digestive action.						
Coverage notes:	Resistance management:	Use of oils and	Compatibility for	Breakdown sensitive to:		
Thorough coverage and penetration		adjuvants:	mixing (with	1. pH: ?		
into canopy is essential. Can be	Do not use lower than label	Talstar® contains a	fungicides fertilisers,	2. High salinity: ?		
applied to soil and leaves.	rates as this will speed up	wetter surfactant.	trace elements etc.)	3. Temperature: ?		
DO NOT APPLY AS FOG OR	selection for resistance.			4. Low humidity: ?		
MIST.			Compatible with most	5. UV light: Do not store in sunlight.		
Variable harvest witholding	Ensure chemical rotation		common fungicides			
periods, see product label for	partners are also effective		and herbicides.			
specific crop.	against target pest.					
			DO NOT MIX			
			CONCENTRATES.			
Key notes on usage:						

Key notes on usage:

To minimise UV breakdown and get maximum contact with pest insects best to apply late in the day/early morning on warm days

Common brand name: Omite®		Active constituent: Propargite - mites			
For details of any current permit or registration:		Compatability with beneficial insects: ?			
Please see attached notes.					
Please check for recent changes to p	permits on the APVMA web				
site: http://www.apvma.gov.au			<u>,                                      </u>		
Mode of action: Contact and	<b>Life stages impacted:</b> Adults a	and nymphs.	Time to kill: ?		
digestive action ?.					
Coverage notes:	Resistance management:	Use of oils and	Compatibility for	Breakdown sensitive to:	
Thorough coverage and penetration	No information?	adjuvants:	mixing (with	1. pH: ?	
into canopy is essential.			fungicides fertilisers,	2. High salinity: ?	
	Do not use lower than label	DO NOT ADD	trace elements etc.)	3. Temperature: ?	
Do not exceed recommended	rates as this will speed up	WETTING AGENTS OR		4. Low humidity: ?	
concentrations per crop as Omite®	selection for resistance.	OILS AS A LEAF	Not recommended for	5. UV light: Do not store in sunlight.	
can be toxic to leaves when used in		TOXIN MAY FORM.	mixing as may become		
excess.	Ensure chemical rotation		ineffective or cause		
	partners are also effective		damage.		
Variable harvest witholding	against target pest.				
periods, see product label for					
specific crop.					

- Key notes on usage:

  Agitate when mixing and add product slowly to water

  To minimise UV breakdown and get maximum contact with pest insects best to apply late in the day/early morning on warm days

Common brand name: Ambush®		Active constituent: Permethrin - mites			
For details of any current permit or registration: Please see attached notes. Please check for recent changes to permits on the APVMA web site: <a href="http://www.apvma.gov.au">http://www.apvma.gov.au</a>		Compatability with	benef	<b>icial insects:</b> Dangerous to	bees. Do not spray when bees are foraging.
Mode of action: Contact ? Life stages impacted: Adults a		and nymphs.		Time to kill: ?	
Coverage notes: Thorough coverage and penetration into canopy is essential.  Variable harvest witholding periods, see product label for specific crop.	Resistance management: No information?  Do not use lower than label rates as this will speed up selection for resistance.  Ensure chemical rotation partners are also effective against target pest.	Use of oils adjuvants: No information?	and	Compatibility for mixing (with fungicides fertilisers, trace elements etc.)  Can be mixed with Agral®, copper oxychloride, Omite® and Pyrimor®. Do not mix with more than one other chemical.	Breakdown sensitive to:  1. pH: ?  2. High salinity: ?  3. Temperature: ?  4. Low humidity: ?  5. UV light: Do not store in sunlight.
				DO NOT MIX CONCENTRATES.	

- Key notes on usage:
  Agitate when mixing and add product slowly to water. Agitate while spraying.
  To minimise UV breakdown and get maximum contact with pest insects best to apply late in the day/early morning on warm days