

Apple Agrichemical Regulatory Risk Assessment

September 2023

Regulatory pressures on agrichemicals are increasing globally, with many being either restricted or withdrawn from use. For older agrichemicals these pressures are often the result of reconsiderations involving new or refined risk assessment methodologies that requiring the generation of new data. A consequence of which can be that many of these agrichemicals are not meeting contemporary risk assessment standards as the necessary data is unavailable, or where data is available, the risk posed is considered unacceptable.

The use of agrichemicals can also be impacted through differences in standards between trading partners. The lack of an appropriate pesticide maximum residue limit (MRL) in an importing country can, for practical purposes, effectively prohibit use in the exporting country so as to ensure compliance, as a MRL breach would adversely affect market access.

The effects of the above are greater regulatory pressure placed on the use of individual agrichemicals or chemical groups. As a consequence it is possible that the number of approved agrichemical options could be adversely impacted.

To assist strategic planning, with respect to future pest management options, the following tables have been developed to highlight the regulatory threats to agrichemicals currently approved for the management of the pests and diseases in apples as well as current initiatives aimed at addressing identified pest management deficiencies.

Active Constituents	Chemical Group	Problem	Comment
INSECT AND OTHER PESTS			
Abamectin	6	European red mite	APVMA: Nominated for spray drift label review Canada: Some uses amended EU: Use restricted to permanent greenhouse
		Two-spotted mites	
Abamectin + chlorantraniliprole	6 + 28	Codling moth	<u>Abamectin</u> APVMA: Nominated for spray drift label review Canada: Some uses amended EU: Use restricted to permanent greenhouse
		European red mite	
		Helicoverpa species	
		Lightbrown apple moth	
		Oriental fruit moth	
		Two-spotted mites	
Acequinocyl	20B	Two-spotted mites	
Acetamiprid + novaluron	4A + 15	Apple dimpling bug(Yellow mirid)	<u>Acetamiprid</u> APVMA: Under review EU: Under review <u>Novaluron</u> EU: No authorisation in place
		Codling moth	
		Longtailed mealybug	
		Woolly apple aphid	
		Lightbrown apple moth	
		Plague thrips	
		San Jose scale	
		Tuber mealybug	
Alpha-cypermethrin	3A	Apple weevil	EU: No authorisation UK: No authorisation
		Garden weevil	

Active Constituents	Chemical Group	Problem	Comment
<i>Bacillus thuringiensis</i>	11A	Caterpillars	EU: Under review for renewal
		Helicoverpa species	
		Lightbrown apple moth	
		Loopers	
		Pear looper	
Bifenazate	20D	Bryobia mite	Canada: Under review
		European red mite	EU: Use restricted to non-edible crops in permanent greenhouses
		Two-spotted mites	
Bifenthrin	3A	Apple dimpling bug(Yellow mirid)	Canada: Not authorised
		Plague thrips	EU: Not authorised
Carbaryl	1A	Codling moth	Canada: Reviewed, large number of uses deleted Codex: Review scheduled, support uncertain EU: Authorisation not renewed USA: Under review
		Helicoverpa species	
		Lightbrown apple moth	
		Pear and cherry slug	
		Pear leaf blister mite	
		Wingless grasshoppers	
Chlorantraniliprole	28	Codling moth	
		Helicoverpa species	
		Lightbrown apple moth	
		Oriental fruit moth	
		Fall armyworm (PER89259)	
Chlorfenapyr	13	Two-spotted mites	EU: No authorisation in place

Active Constituents	Chemical Group	Problem	Comment
Chlorpyrifos	1B	Apple dimpling bug(Yellow mirid)	APVMA: Under review Codex: All MRLs revoked Canada: Cancellation of all uses. EU: No authorisation in place USA: EPA decision to cancel uses
		Lightbrown apple moth	
		Locusts	
		Mealybugs	
		San Jose scale	
		Wingless grasshoppers	
		Woolly apple aphid	
		Queensland fruit fly (Bait spray)	
Clofentezine	10A	Bryobia mite	EU: No authorisation
		European red mite	
		Two-spotted mites	
Clothianidin	4A	Codling moth	APVMA: Under review Canada: Field uses cancelled or amended EU: Not authorised USA: Re-registration with new risk mitigation measures
		Fruit flies	
		Longtailed mealybug	
		Woolly apple aphid	
		Tuber mealybug	
Cyclaniliprole	28	Codling moth	EU: No authorisation
<i>Cydia pomonella</i> granulosis virus	31	Codling moth	
		Oriental fruit moth	
Cyflumetofen	25A	Bryobia mite	
		European red mite	
		Two-spotted mites	
Deltamethrin + MAGMED	3	Medfly (PER92548-WA only)	
Diazinon	1B	Greedy scale	APVMA: Under review EU: No authorisation in place Codex: Withdrawal of Codex MRLs recommended
		San Jose scale	
		Woolly apple aphid	
Dimethoate	1B	Fruit flies(PER13859) (After harvest orchard clean-up spray)	Codex: No MRLs EU: No authorisations
Dodecadienol (pheromone)	-	Codling moth	

Active Constituents	Chemical Group	Problem	Comment
Ethyl formate (Po)	8A	Eucalyptus weevil	EU: No authorisation in place
		Latania scale	
		Obscure mealybug	
		Onion thrips	
Etoxazole	10B	Bryobia mite	EU: Only uses on greenhouse ornamentals approved & Candidate for substitution
		European red mite	
		Two-spotted mites	
Fatty acids: K salt	UN	Aphids	
		Mealybug	
		Spider mites	
		Thrips	
		Whitefly	
Fenbutatin oxide	12B	Bryobia mite	APVMA: nominated for review Codex: To be reviewed by JMPR. No supporting registrant EU: No authorisation in place USA: Under review
		European red mite	
		Two-spotted mites	
Fenitrothion	1B	Locusts	EU: No authorisation in place
		Wingless grasshoppers	
Fenoxycarb	7B	Codling moth	EU: No authorisation in place
		Lightbrown apple moth	
		San Jose scale	
Fenpyroximate	21A	European red mite	
		Two-spotted mites	
Fipronil	2B	Ants	APVMA: Under review Codex: No MRL EU: No authorisation in place USA: Under review
		Fruit fly trap toxicant	

Active Constituents	Chemical Group	Problem	Comment
Flonicamid	29	Tuber mealybug	
		Woolly apple aphid	
Helicoverpa NPV	31	Helicoverpa species	
Hexythiazox	10A	European red mite	
		Two-spotted mites	
Imidacloprid	4A	Woolly apple aphid	APVMA: Under review Canada: Field uses cancelled or amended EU: No authorisation. Grace period expired (June 2022) USA: Re-registration with new risk mitigation measures
Indoxacarb	22A	Apple weevil	Canada: No authorisations EU: Authorisation not renewed. Grace period expired 19/9/2022 UK: Proposed non-renewal
		Codling moth	
		Fuller's rose weevil	
		Garden weevil	
		Helicoverpa species	
		Lightbrown apple moth	
		Red imported fire ant	
Wingless grasshoppers			
Lambda-cyhalothrin	3A	Fruit flies(PER12961 – SA Biosecurity) (Soil drench)	EU: Candidate for substitution

Active Constituents	Chemical Group	Problem	Comment
Maldison/malathion	1B	Apple leafhopper	APVMA: Under review Codex: Re-evaluation scheduled EU: Restricted use to permanent greenhouses
		European red mite	
		Locusts	
		Spider mites	
		Thrips	
		Two-spotted mites	
		Wingless grasshoppers	
		Woolly apple aphid	
		Fruit flies	
		Codling moth	
Methomyl	1A	Apple dimpling bug(Yellow mirid)	APVMA: nominated for review Canada: Re-evaluation completed. Majority of uses removed EU: No authorisations in place USA: Under review
		Codling moth	
		Helicoverpa species	
		Lightbrown apple moth	
		Plague thrips	
		Thrips	
		Fall armyworm (PER89293)	
Methoxyfenozide	18	Lightbrown apple moth	EU: Proposed restricted authorisation & Candidate for substitution
		Loopers	
Milbemectin	6	European red mite	
		Two-spotted mites	
NPV	31	Helicoverpa spp	
Omethoate	1B	Two-spotted mites	Codex: No MRLs Canada: No approvals in place EU: No authorisations in place USA: No approvals in place
		European red mite	
		Woolly apple aphid	

Active Constituents	Chemical Group	Problem	Comment
Paraffinic oil/ petroleum oil	UNM	Two-spotted mites	
		Mites	
		Spider mites	
		Bryobia mite	
		European red mite	
		Frosted scale	
		Oystershell scale	
		San Jose scale	
		Scale insects	
		Armoured (Hard) scales	
		Pear scale	
Pirimicarb	1A	Woolly apple aphid	Codex: JMPR Periodic re-evaluation scheduled EU: Candidate for substitution
Propargite	12C	European red mite	APVMA: nominated for review EU: No authorisations
		Mites	
		Two-spotted mites	
Pyrethrins	3A	Ants	Canada: Under review
		Aphids	
		Apple leafhopper	
		Caterpillars	
		Codling moth	
		Earwigs	
		Plague thrips	
Thrips			
Pyridaben	21A	European red mite	
		Two-spotted mite	

Active Constituents	Chemical Group	Problem	Comment
Pyriproxyfen	7C	Ants	
		Red imported fire ant (PER87728)	
Spinetoram	5	Caterpillars	
		Codling moth	
		Helicoverpa species	
		Lightbrown apple moth	
		Loopers	
		Oriental fruit moth	
		Pear and cherry slug	
		Western flower thrips	
		Fruit flies(PER12590)	
Spinosad	5	Helicoverpa species	
		Lightbrown apple moth	
		Loopers	
		Pear and cherry slug	
		Western flower thrips	
		Fruit flies(PER80719) (Lures) (Bait spray)	
		Fall armyworm(PER89870)	
Spirotetramat	23	Longtailed mealybug	
		San Jose scale	
		Tuber mealybug	
		Woolly apple aphid	

Active Constituents	Chemical Group	Problem	Comment
Sulfoxaflor	4C	Apple dimpling bug(Yellow mirid)	USA: Pollinator concerns EU: Restricted to permanent glasshouses only
		Longtailed mealybug	
		San Jose scale	
		Tuber mealybug	
		Woolly apple aphid	
Sulfur	UN	Bryobia mite	
		European red mite	
		Pear leaf blister mite	
		San Jose scale	
Tau-fluvalinate	3A	Apple dimpling bug(Yellow mirid)	
		Plague thrips	
Tebufenozide	18	Codling moth	
		Lightbrown apple moth	
Tebufenpyrad	21A	European red mite	EU: Candidate for substitution
		Two-spotted mite	
Tetraniliprole	28	Apple weevil	EU: No authorisation
		Codling moth	
		Fuller's rose weevil	
		Garden weevil	
		Lightbrown apple moth	
Thiacloprid	4A	Apple dimpling bug(Yellow mirid)	APVMA: Under review EU: No authorisation in place USA: No authorisation
		Codling moth	
		Oriental fruit moth	
		Woolly apple aphid	
		Mediterranean fruit fly (PER14562)	
Trichlorfon	1B	Fruit flies	APVMA: nominated for review Codex: No MRLs EU: No authorisations USA: No MRLs
		Rutherglen bug	

Active Constituents	Chemical Group	Problem	Comment
DISEASES			
BCDMH	-	Surface sterilisation	EU: Under assessment
Boscalid + pyraclostrobin	7 + 11	Alternaria leaf blotch/fruit spot	Boscalid
		Black spot	Canada: Under review
		Powdery mildew	
Bupirimate	8	Powdery mildew	
Captan	M4	Black spot	EU: Under review proposed restriction to use in permanent greenhouses only USA: Under review
Chlorine (Calcium /sodium hypochlorite)	M	Surface moulds: Post-harvest (PER10822)	EU: No authorisation
Copper	M1	Bitter rot	EU: Candidates for substitution
		Black spot	
		Fly speck	
		Ripe fruit rot	
		Sooty blotch	
Cyproconazole + iodocarb	3 + 28	Silver leaf	<u>Cyproconazole</u> APVMA: nominated for review EU: No authorisation in place <u>Iodocarb</u> EU: No authorisation in place
Cyprodinil	9	Black spot	Canada: Under review EU: Candidate for substitution
Cyprodinil + fludioxonil	9+12	Alternaria leaf and fruit blotch (Suppression)	<u>Cyprodinil</u> : Canada: Under review EU: Candidate for substitution <u>Fludioxonil</u> : EU: Under review & candidate for substitution
Difenoconazole	3	Black spot	APVMA: nominated for review
		Powdery mildew	EU: Candidate for substitution USA: Under review

Active Constituents	Chemical Group	Problem	Comment
Dithianon	M9	Alternaria leaf blotch/fruit spot	EU: Use restricted to non-edible crops
		Bitter rot	
		Black spot	
Dodine	U12	Black spot	
Fluazinam	29	White root rot	Canada: Under review
Fludioxonil	12	Blue mould	EU: Under review & candidate for substitution
		Grey mould	
Fluopyram + trifloxystrobin	7 + 11	Black spot	<u>Trifloxystrobin</u>
		Powdery mildew	Canada: Under review
		Alternaria leaf blotch/fruit spot	
Fluxapyroxad	7	Alternaria leaf blotch/fruit spot	
		Black spot	
		Powdery mildew	
Fosetyl-Al	33	Phytophthora trunk/collar rot	Canada: Under review
Hexaconazole	3	Black spot	APVMA: nominated for review
		Powdery mildew	EU: No authorisation in place
Imazalil	3	Blue mould	EU: Under review -data gaps identified. Withdrawal of many EU MRLs proposed.
Iodine (Post harvest)	M	Bactericide/fungicide	
Iprodione	2	Blue & green moulds	Canada: Majority of food crop uses deleted Codex: Review scheduled EU: No authorisation USA: Proposed deletion or restriction of uses
		Blue mould	
		Botrytis blight	
		Ripe fruit rot	
		Storage rot	
Isopyrazam	7	Black spot	EU: No authorisation
		Powdery mildew	
Kresoxim-methyl	11	Black spot	Canada: Reduced number of applications
		Powdery mildew	

Active Constituents	Chemical Group	Problem	Comment
Mancozeb	M3	Bitter rot	APVMA: nominated for review Canada: Many uses cancelled Codex: To be reviewed 2024/25 EU: No authorisation
		Black spot	
		Fly speck	
		Powdery mildew	
		Ripe fruit rot	
		Sooty blotch	
		Target spot (Early blight)	
Mefentrifluconazole	3	Alternaria leaf blotch/fruit spot	
		Black spot	
		Powdery mildew	
Metiram	M3	Alternaria leaf blotch/fruit spot (PER12864)	APVMA: nominated for review Canada: Only use on potato retained Codex: To be reviewed 2024/25 EU: No authorisation
		Bitter rot	
		Black spot	
		Fly speck	
		Ripe fruit rot	
		Sooty blotch	
Myclobutanil	3	Black spot	APVMA: nominated for review EU: No authorisation in place
		Powdery mildew	
Penconazole	3	Black spot	APVMA: nominated for review
		Powdery mildew	
Penthiopyrad	7	Black spot	
		Powdery mildew	
Petroleum oil	-	Powdery mildew	
Polyoxin-D	19	Alternaria leaf blotch/fruit spot	EU: No authorisation in place
		Powdery mildew	
Potassium bicarbonate	M2	Powdery mildew	EU: No authorisation in place
Proquinazid	13	Powdery mildew	

Active Constituents	Chemical Group	Problem	Comment
Pyrimethanil	9	Blue mould	Canada: Under review
		Grey mould	
		Ripe fruit rot	
Quintozene	14	Collar rot	Codex: Re-evaluation EU: No authorisations
Sulfur	M2	Black spot	
		Powdery mildew	
Tebuconazole	3	Silver leaf	APVMA: nominated for review Canada: Under review EU: Candidate for substitution USA: Under review
Thiabendazole	1	Blue mould	
		Grey mould	
		Ripe fruit rot	
Thiram	M3	Black spot	APVMA: nominated for review Canada: Not authorised Codex: To be reviewed 2024/25 EU: No authorisation in place
		Ripe fruit rot	
Trifloxystrobin	11	Black spot	Canada: Under review
		Powdery mildew	
Triforine	3	Black spot	APVMA: nominated for review
		Powdery mildew	EU: No authorisation
Zineb	M3	Bitter rot	APVMA: nominated for review
		Black spot	Codex: To be reviewed 2024/25
		Sooty blotch	EU: No authorisation in place
		Bitter rot	APVMA: nominated for review
Ziram	M3	Black spot	Canada: Cancelling of all uses Codex: To be reviewed 2024/25 EU: Candidate for substitution

Active Constituents	Chemical Group	Comment
BROADLEAF WEEDS AND GRASSES		
2,2-DPA as Na salt	0	
Amitrole	34	APVMA: nominated for review EU: No authorisation in place
Asulam	18	EU: Under review, proposed restriction to non-edible crops
Carfentrazone-ethyl	14	
Clethodim (Non-bearing trees)	1	Codex: MRLs proposed for deletion
Dichlobenil	29	EU: No authorisation in place
Diquat	22	APVMA: Currently under review EU: No authorisation in place
Fluazifop	1	
Flumioxazin	14	EU: Candidates for substitution
Glufosinate	10	Canada: Review proposed EU: No authorisation in place
Glyphosate	9	Ongoing issues internationally EU: Under review
Haloxyfop-P	1	EU: No authorisation in place
Isoxaben (Non-bearing trees)	29	
Norflurazon	12	EU: No authorisation in place
Oryzalin	3	EU: No authorisation in place
Oxyfluorfen	14	EU: Candidate for substitution USA: Interim review decision Label amendments proposed
Paraquat	22	APVMA: Currently under review Canada: Under review EU: No authorisation in place Rotterdam Convention: nominated
Saflufenacil	14	EU: No authorisation in place
Simazine	5	APVMA: nominated for review EU: No authorisation in place
Terbacil	5	EU: No authorisation
Trifluralin	3	EU: No authorisation

Active Constituents	Chemical Group	Comment
PLANT GROWTH REGULATORS		
1-methyl-cyclopropene	-	
6-benzyladenine	-	
ammonium thiosulfate	-	EU: No authorisation
AVG	-	EU: No authorisation
Cyanamide	-	EU: No authorisation
DPA	-	EU: No authorisation
Ethephon	-	
Gibberellins	-	
NAA	-	
Paclobutrazol	-	EU: Candidate for substitution
Prohexadione-calcium	-	
Carbaryl	1A	Canada: Reviewed, large number of uses deleted Codex: Review scheduled, support uncertain EU: Authorisation not renewed USA: Under review
Metamitron	C	

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Communications Manager

Hort Innovation

Level 7, 141 Walker Street

North Sydney NSW 2060

Australia

Email: communications@horticulture.com.au

Phone: 02 8295 2300