

CropLife Australia Herbicide Resistance Management Review Group

Herbicide Mode of Action Groups (valid as at 7 June 2017)

List of approved active constituents in each "Group" and, for ease of identification, at the discretion of the Herbicide Resistance Management Review Group the trade name of the first registered product or successor. Refer to the APVMA website (www.apvma.gov.au) to obtain a complete list of registered products from the PUBCRIS database.

High Resistance Risk

CHEMICAL FAMILY	ACTIVE CONSTITUENT (FIRST REGISTERED TRADE NAME)
GROUP A	Inhibitors of acetyl co-enzyme A carboxylase (Inhibitors of fat synthesis/ACC'ase inhibitors)
<i>Aryloxyphenoxypropionates:</i> (Fops):	clodinafop (Topik [®]), cyhalofop (Barnstorm [®]), diclofop (Cheetah [®] Gold [*] , Decision ^{®*} , Hoegrass [®]), fenoxaprop (Cheetah [®] Gold [*] , Wildcat [®]), fluazifop (Fusilade [®] , Fusion ^{®*}), haloxyfop (Verdict [®]), propaquizafop (Shogun [®]), quizalofop (Targa [®])
<i>Cyclohexanediones:</i> (Dims):	butoxydim (Falcon [®] , Fusion ^{®*}), clethodim (Select [®]), profoxydim (Aura [®]), sethoxydim (Cheetah [®] Gold [*] , Decision ^{®*}), tralkoxydim (Achieve [®])
<i>Phenylpyrazoles:</i> (Dens):	pinoxaden (Axial [®])
GROUP B	Inhibitors of acetolactate synthase (ALS inhibitors), acetohydroxyacid synthase (AHAS)
<i>Imidazolinones:</i> (Imis):	imazamox (Intervix ^{®*} , Raptor [®]), imazapic (Bobcat I-Maxx ^{®*} , Flame [®] , Midas ^{®*} , OnDuty ^{®*}), imazapyr (Arsenal Xpress ^{®*} , Intervix ^{®*} , Lightning ^{®*} , Midas ^{®*} , OnDuty ^{®*}), imazethapyr (Lightning ^{®*} , Spinnaker [®])
<i>Pyrimidinylthiobenzoates:</i>	bispyribac (Nominee [®]), pyriothiac (Staple [®])
<i>Sulfonylureas:</i> (SUs):	azimsulfuron (Gulliver [®]), bensulfuron (Londax [®]), chloresulfuron (Glean [®]), ethoxysulfuron (Hero [®]), foramsulfuron (Tribute [®]), halosulfuron (Sempra [®]), iodosulfuron (Hussar [®]), mesosulfuron (Atlantis [®]), metsulfuron (Ally [®] , Harmony [®] M, Stinger ^{®*} , Trounce ^{®*} , Ultimate Brushweed ^{®*} Herbicide), prosulfuron (Casper [®]), rimsulfuron (Titus [®]), sulfometuron (Oust [®] , Eucmix Pre Plant [®]), sulfosulfuron (Monza [®]), thifensulfuron (Harmony [®] M), triasulfuron, (Logran [®] , Logran [®] B-Power ^{®*}), tribenuron (Express [®]), trifloxysulfuron (Envoke [®] , Krismat ^{®*})
<i>Triazolopyrimidines:</i> (Sulfonamides):	florasulam (Paradigm ^{®*} , Vortex ^{®*} , X-Pand [®]), flumetsulam (Broadstrike [®]), metosulam (Eclipse [®]), pyroxsulam (Crusader [®] , Rexade [®])

* **This product contains more than one active constituent**

This document is a guide only and does not endorse particular products, groups of products or cultural methods in terms of their performance. Always follow the product label for specific use instructions. While all effort has been taken with the information supplied in this document no responsibility, actual or implied, is taken for the day to day accuracy of product or active constituent specific information. Readers should check with the Australian regulator's (APVMA) product database for contemporary information on products and actives. The database can be sourced through www.apvma.gov.au. The information given in this document is provided in good faith and without any liability for loss or damage suffered as a result of its application and use.

Advice given in this strategy is **valid as at 7 June 2017**. All previous versions of this strategy are now invalid.

CropLife Australia Limited

Locked Bag 4396, Kingston ACT 2604

Phone: 02 62732733 Email: info@croplife.org.au Website: www.croplife.org.au

Moderate Resistance Risk

CHEMICAL FAMILY	ACTIVE CONSTITUENT (FIRST REGISTERED TRADE NAME)
GROUP C	Inhibitors of photosynthesis at photosystem II (PS II inhibitors)
<i>Amides:</i>	propanil (Stam [®])
<i>Benzothiadiazinones:</i>	bentazone (Basagran [®] , Basagran [®] M60*, Lawnweeder plus ^{®*})
<i>Nitriles:</i>	bromoxynil (Barrel ^{®*} , Bucril [®] , Bucril [®] MA*, Eliminar C ^{®*} , Flight ^{®*} , Jaguar ^{®*} , Talinor ^{®*} , Triathlon ^{®*} , Velocity ^{®*}), ioxynil (Actril DS*, Totril [®] .)
<i>Phenylcarbamates:</i>	phenmedipham (Betanal [®])
<i>Pyridazinones:</i>	chloridazon (Pyramin [®])
<i>Triazines:</i>	ametryn (Amigan [®] , Gesapax [®] Combi*, Krismat [®] , Primatol Z [®]), atrazine (Gesapax [®] Combi*, Gesaprim [®] , Primextra [®] Gold*), cyanazine (Bladex [®]), prometryn (Bandit ^{®*} , Cotogard [®] , Gesagard [®]), propazine (Agaprop [®]), simazine (Gesatop [®]), terbutylazine (Terbyne [®]), terbutryn (Agtryne [®] MA*, Amigan [®] , Igran [®])
<i>Triazinones:</i>	hexazinone (Bobcat I-Maxx ^{®*} , Velpar [®] K4*, Velpar [®] L), metribuzin (Aptitude ^{®*} , Sencor [®])
<i>Uracils:</i>	bromacil (Hyvar [®] , Krovar ^{®*}), terbacil (Eucmix Pre Plant ^{®*} , Sinbar [®])
<i>Ureas:</i>	diuron (Karmex [®] , Krovar ^{®*} , Velpar [®] K4*), fluometuron (Bandit ^{®*} , Cotogard ^{®*} , Cotoran [®]), linuron (Afalon [®]), methabenzthiazuron (Tribunil [®]), siduron (Tupersan [®]), tebuthiuron (Graslan [®])
GROUP D	Inhibitors of microtubule assembly
<i>Benzamides:</i>	propyzamide (Kerb [®])
<i>Benzoic acids:</i>	chlorthal (Dacthal [®] , Prothal ^{®*})
<i>Dinitroanilines: (DNAs):</i>	oryzalin (Rout ^{®*} , Surflan [®]), pendimethalin (Stomp [®]), prodiamine (Barricade [®]), trifluralin (Jetti Duo ^{®*} , Treflan [®])
<i>Pyridines:</i>	dithiopyr (Dimension [®])
GROUP E	Inhibitors of mitosis / microtubule polymerisation
<i>Carbamates:</i>	carbetamide (Carbetamex [®]), chlorpropham (Chlorpropham [®])
GROUP F	Bleachers: Inhibitors of carotenoid biosynthesis at the phytoene desaturase step (PDS inhibitors)
<i>Pyridazinones:</i>	norflurazon (Solicam [®])
<i>Pyridinecarboxamide:</i>	diflufenican (Brodal [®] , Spearhead ^{®*} , Jaguar ^{®*} , Tigrex ^{®*} , Triathlon ^{®*} , Yates Pathweeder ^{®*}), picolinafen (Eliminar C ^{®*} , Flight ^{®*} , Paragon ^{®*} , Sniper [®])
GROUP G	Inhibitors of protoporphyrinogen oxidase (PPOs)
<i>Diphenylethers:</i>	acifluorfen (Blazer [®]), oxyfluorfen (Goal [®] , Rout ^{®*} , Yates Pathweeder ^{®*})
<i>N-phenylphthalimides:</i>	flumioxazin (Valor [®])
<i>Oxadiazoles:</i>	oxadiargyl [®] (Raft), oxadiazon (Ronstar [®])
<i>Phenylpyrazole:</i>	pyraflufen (Ecopar [®] , Pyresta ^{®*})
<i>Pyrimidindiones:</i>	butafenacil (Logran [®] B-Power ^{®*} , Resolva ^{®*}), saflufenacil (Sharpen [®])
<i>Triazolinones:</i>	carfentrazone (Affinity [®] , Aptitude ^{®*} , Broadway ^{®*} , Silverado ^{®*})

* **This product contains more than one active constituent**

This strategy is a guide only and does not endorse particular products, groups of products or cultural methods in terms of their performance. Always follow the product label for specific use instructions. While all effort has been taken with the information supplied in this document no responsibility, actual or implied, is taken for the day to day accuracy of product or active constituent specific information. Readers should check with the Australian regulator's (APVMA) product database for contemporary information on products and actives. The data base can be sourced through www.apvma.gov.au. The information given in this strategy is provided in good faith and without any liability for loss or damage suffered as a result of its application and use.

Advice given in this strategy is Valid as at 7 June 2017. All previous versions of this strategy are now invalid.

Phone: 02 62732733 Email: info@croplife.org.au Website: www.croplife.org.au

Moderate Resistance Risk

CHEMICAL FAMILY	ACTIVE CONSTITUENT (FIRST REGISTERED TRADE NAME)
GROUP H	Bleachers: Inhibitors of 4-hydroxyphenyl-pyruvate dioxygenase (HPPDs)
<i>Isoxazoles:</i>	isoxaflutole (Balance [®])
<i>Pyrazoles:</i>	benzofenap (Taipan [®]), pyrasulfotole (Precept ^{®*} , Velocity ^{®*})
<i>Triketone:</i>	Bicyclopyrone (Talinator ^{®*})
GROUP I	Disruptors of plant cell growth (Synthetic Auxins)
<i>Arylpicolinate:</i>	halauxifen (ForageMax ^{®*} , Paradigm ^{®*} , Rexade ^{®*})
<i>Benzoic acids:</i>	dicamba (Banvel [®] , Banvel M ^{®*} , Barrel ^{®*} , Casper ^{®*} , Lawnweeder plus ^{®*} , Mecoban [®] , Methar Tri-Kombi ^{®*})
<i>Phenoxy-carboxylic acids:</i> (<i>Phenoxys</i>):	2,4-D (Actril DS ^{®*} , Amicide [®] , Fallow Boss Tordon ^{®*} , Methar Tri-Kombi ^{®*} , Pyresta ^{®*} , Vortex ^{®*}), 2,4-DB (Trifolamine [®]), dichlorprop (Lantana 600 [®]), MCPA (Agtryne [®] MA [*] , Banvel M ^{®*} , Barrel ^{®*} , Basagran [®] M60 [*] , Buctril [®] MA [*] , Flight ^{®*} , Lawnweeder plus ^{®*} , MCPA, Midas ^{®*} , Paragon ^{®*} , Precept ^{®*} , Silverado ^{®*} , Spearhead ^{®*} , Tigrex ^{®*} , Tordon 242 ^{®*} , Triathlon ^{®*}), MCPB (Legumine [®]), mecoprop (Mecoban [®] , Mecopropamine [®] , Methar Tri-Kombi ^{®*} , Multiweed ^{®*})
<i>Pyridine carboxylic acids:</i> (<i>Pyridines</i>):	aminopyralid (Fallow Boss Tordon ^{®*} , ForageMax ^{®*} , Grazon Extra ^{®*} , Hotshot ^{®*} , Stinger ^{®*} , Vigilant II ^{®*}), clopyralid (Lontrel [®] , Spearhead ^{®*}), fluroxypyr (Hotshot ^{®*} , Starane [®]), picloram (Fallow Boss Tordon ^{®*} , Grazon Extra ^{®*} , Tordon [®] , Tordon 242 ^{®*} , Tordon Regrowth Master ^{®*} , Trinoc ^{®*} , Vigilant II ^{®*}), triclopyr (Garlon [®] , Grazon Extra ^{®*} , Tordon Regrowth Master ^{®*} , Tough Roundup [®] Weedkiller [*] , Ultimate Brushweed ^{®*} Herbicide)
<i>Quinoline carboxylic acids:</i>	quinclorac (Drive [®])
GROUP J	Inhibitors of lipid synthesis (Not ACCase inhibitors)
<i>Benzofurans:</i>	ethofumesate (Tramat [®])
<i>Chlorocarbonic acids:</i>	2,2-DPA (Dalapon [®]), flupropanate (Frenock [®])
<i>Phosphorodithioates:</i>	bensulide (Prefar [®])
<i>Thiocarbamates:</i>	EPTC (Eptam [®]), molinate (Ordram [®]), pebulate (Tillam [®]), prosulfocarb (Arcade [®] , Boxer [®] Gold [*]), thiobencarb (Saturn [®]), triallate (Avadex [®] , Jetty Duo ^{®*}), vernolate (Vernam [®])
GROUP K	Inhibitors of cell division / Inhibitors of very long chain fatty acids (VLCFA inhibitors)
<i>Acetamides:</i>	napropamide (Devrinol [®])
<i>Chloroacetamides:</i>	dimethenamid (Frontier [®] -P, Outlook [®]), metazachlor (Butisan [®]), metolachlor (Boxer [®] Gold [*] , Dual [®] Gold, Primextra [®] Gold [*]), propachlor (Prothal ^{®*} , Ramrod [®])
<i>Isoxazoline:</i>	pyroxasulfone (Sakura [®])
GROUP L	Inhibitors of photosynthesis at photosystem I via electron diversion (PSI inhibitors)
<i>Bipyridyls:</i>	diquat (Reglone [®] , Spray Seed ^{®*}), paraquat (Alliance ^{®*} , Gramoxone [®] , Spray Seed ^{®*})

* **This product contains more than one active constituent**

This strategy is a guide only and does not endorse particular products, groups of products or cultural methods in terms of their performance. Always follow the product label for specific use instructions. While all effort has been taken with the information supplied in this document no responsibility, actual or implied, is taken for the day to day accuracy of product or active constituent specific information. Readers should check with the Australian regulator's (APVMA) product database for contemporary information on products and actives. The data base can be sourced through www.apvma.gov.au. The information given in this strategy is provided in good faith and without any liability for loss or damage suffered as a result of its application and use.

Advice given in this strategy is **Valid as at 7 June 2017**. All previous versions of this strategy are now invalid.

Phone: 02 62732733 Email: info@croplife.org.au Website: www.croplife.org.au

Moderate Resistance Risk

CHEMICAL FAMILY	ACTIVE CONSTITUENT (FIRST REGISTERED TRADE NAME)
GROUP M	Inhibitors of 5-enolpyruvyl shikimate-3 phosphate (EPSP) synthase
<i>Glycines:</i>	glyphosate (Arsenal Xpress [®] , Broadway [®] , Illico [®] , Resolva [®] , Roundup [®] , Tough Roundup [®] Weedkiller [®] , Trounce [®] , Yates Pathweeder [®])
GROUP N	Inhibitors of glutamine synthetase
<i>Phosphinic acids:</i>	glufosinate (Basta [®] , Liberty [®])
GROUP O	Inhibitors of cell wall (cellulose) synthesis
<i>Alkylazines:</i>	indaziflam (Specticle [®])
<i>Benzamides:</i>	isoxaben (Gallery [®] , X-Pand [®])
<i>Nitriles:</i>	dichlobenil (Casoron [®])
GROUP P	Inhibitors of auxin transport
<i>Phthalamates:</i>	naptalam (Alanap-L [®])
GROUP Q	Bleachers: Inhibitors of carotenoid biosynthesis unknown target
<i>Isoxazolidinones:</i>	clomazone (Command [®])
<i>Triazoles:</i>	amitrole (Alliance [®] *, Amitrole [®] , Illico [®] *)
GROUP R	Inhibitors of dihydropteroate synthase (DHP inhibitors)
<i>Carbamates:</i>	asulam (Asulox [®])
GROUP Z	Herbicides with unknown and probably diverse sites of action
<i>Arylamino propionic acids:</i>	flamprop (Mataven L [®])
<i>Dicarboxylic acids:</i>	endothal (Endothal [®])
<i>Organoarsenicals:</i>	DSMA (disodium methylarsonate) (Methar [®] , Trinoc [®] *), MSMA (monosodium methylarsonate) (Daconate [®])

* ***This product contains more than one active constituent***

This strategy is a guide only and does not endorse particular products, groups of products or cultural methods in terms of their performance. Always follow the product label for specific use instructions. While all effort has been taken with the information supplied in this document no responsibility, actual or implied, is taken for the day to day accuracy of product or active constituent specific information. Readers should check with the Australian regulator's (APVMA) product database for contemporary information on products and actives. The data base can be sourced through www.apvma.gov.au. The information given in this strategy is provided in good faith and without any liability for loss or damage suffered as a result of its application and use.

Advice given in this strategy is **Valid as at 7 June 2017**. All previous versions of this strategy are now invalid.
Phone: 02 62732733 Email: info@croplife.org.au Website: www.croplife.org.au