

<i>beta</i> -cyfluthrin	I	Na channel modulator				170	1189
<i>beta</i> -cypermethrin	I	Na channel modulator	>2000				93
bifenazate	A	Mitochondrial complex III electron transport inhibitor	1036			>2000	>5000
bifenox	H	Inhibition of protoporphyrinogen oxidase	>2000	>4640			1600
bifenthrin	I	Na channel modulator	1800	>2150			54.5
bispyribac	H	Inhibition of acetolactate synthase	>2250				2635
bitertanol	F	C ₁₄ -demethylase in sterol biosynthesis, DMI	776	>2000			>5000
bixafen	F	complex II succinate-dehydrogenase inhibitor (SDHI)	>2000				>5000
boscalid	F	complex II succinate-dehydrogenase inhibitor (SDHI)	>2000				>5000
bromoxynil	H	Inhibition of photosynthesis at PSII histidine 215 binders	217				126
bromuconazole	F	C ₁₄ -demethylase in sterol biosynthesis, DMI	>2150	>2150			328
bupirimate	F	adenosine-deaminase			>5000		4000
buprofezin	I	Inhibitor of chitin biosynthesis type 1	>2000	>2000			>2000
carbaryl	A/I	AChE inhibitor		>2000			614
carbendazim	F	β -tubulin assembly in mitosis	>2250				>10000
carbetamide	H	Inhibition of microtubule organization	>2000				>2000
carbofuran	A/I	AChE inhibitor	8	0.76	4.9		5.3
carbosulfan	I	AChE inhibitor	82	10			101
carboxin	F	complex II succinate-dehydrogenase inhibitor (SDHI)	>2150				2588
carfentrazone-ethyl	H	Inhibition of protoporphyrinogen oxidase	>2250				>5000
chlorantraniliprole	I	Ryanodine receptor modulator	>2250				>5000
chlorfenapyr	A/I	Uncoupler of oxidative phosphorylation via disruption of the proton gradient	34	8.3			626

chloridazon	H	Inhibition of photosynthesis at PSII serine 264 binders	>2000			2140
chlorotalonil	F	multi-site contact activity	>2000	>2000		>5000
chlorotoluron	H	Inhibition of photosynthesis at PSII serine 264 binders		272		>10000
chlorpropham	H	Inhibition of microtubule organization		>2000		4200
chlorpyrifos	A/I	AChE inhibitor		13.3		66-195
chlorsulfuron	H	Inhibition of acetolactate synthase	>5000	>5000		>5545
cinidon-ethyl	H	Inhibition of protoporphyrinogen oxidase	>2000			>2200
clodinafop	H	Inhibition of acetyl-CoA carboxylase	1363	>1874		1392
clofentezine	A	Mite growth inhibitors affecting CHS1		>3000		>5200
clomazone	H	Inhibition of deoxy- <i>D</i> -xylose phosphate synthase	>2510	>2510		1369
clopyralid	H	auxin mimics		1465		>5000
cloransulam-methyl	H	Inhibition of acetolactate synthase	>2250			>5000
clothianidin	I	nAChR competitive modulator		430		389
cyantraniliprole	I	Ryanodine receptor modulator	>2250		>2250	>5000
cyazofamid	F	Complex III cytochrome bc1 at Qi site, Quinone inside inhibitor	>2000	>2000		>5000
cyclanilide	PGR		240			208
cyclaniliprole	I	Ryanodine receptor modulator	>2000			>2000
cycloxydim	H	Inhibition of acetyl-CoA carboxylase	>2000			3830
cyflufenamid	F	Unknown MOA	>2000			>5000
cyflumetofen	A	Mitochondrial complex II electron transport inhibitor	>2000	>2000		>2000
cyhalofop-butyl	H	Inhibition of acetyl-CoA carboxylase	>2250	>2250		>5000
cymoxanil	F	Unknown MOA	>2000			760
cyproconazole	F	C ₁₄ -demethylase in sterol biosynthesis, DMI	94	>2000		350
cyprodinil	F	methionine biosynthesis (proposed)	>2000	>500		>2000

cyromazine	A/I	Moulting disruptor, dipteran	1785	>2510	2338		3387
<i>d,d-trans-</i> cyphenothrin	I	Na channel modulator	>5620				188
2,4-D	H	auxin mimics	500		617.3	633	554
deet	repel	repellant	1375				2847
deltamethrin	I	Na channel modulator	>2250	>4640			87
diazinon	A/I	AChE inhibitor		1.44			1129
dicamba	H	auxin mimics	216	1373			1581
dichlobenil	H	Inhibition of cellulose synthesis	698				>2000
dichlorprop-P	H	auxin mimics	308.1				567
2-ethylhexyl ester	H	auxin mimics	1010				824
diclofop-methyl	H	Inhibition of acetyl-CoA carboxylase	>2250				512
dicloran	F	cell peroxidation	900				>2000
diethofencarb	F	β -tubulin assembly in mitosis	>2250	>2250			>5000
difenoconazole	F	C ₁₄ -demethylase in sterol biosynthesis, DMI			>2000		>1453
diflubenzuron	I	inhibitor of chitin biosynthesis affecting CHS1	>5000	>5000			>4640
dimethachlor	H	Inhibition of very long-chain fatty acid synthesis			524		1600
dimethenamid	H	Inhibition of very long-chain fatty acid synthesis	1908				397
dimethoate	A/I	AChE inhibitor	10.5				245
dimethomorph	F	cellulose synthase	>2000	>2000			3900
dimoxystrobin	F	Complex III cytochrome bc1 at Qo site, Quinone outside inhibitor	>2000				>5000
dinotefuran	I	nAChR competitive modulator			>2000		>2000
diquat	H	PSI electron diversion		71		30.9	214
dithianon	F	multi-site contact activity	309	>2000			300
diuron	H	Inhibition of photosynthesis at PSII serine 264 binders	1104				2000
emamectin benzoate	I	Glutamate-gated Cl channel allosteric modulator		76			83
epoxyconazole	F	C ₁₄ -demethylase in sterol biosynthesis, DMI	>2000				3160
esfenvalerate	I	Na channel modulator	1312				88.5
ethametsulfuron- methyl	H	Inhibition of acetolactate synthase	2250				>5000

ethofumesate	H	Inhibition of very long-chain fatty acid synthesis	>2000	>2000		>5000
ethoprophos	N/I	AChE inhibitor	6.04			47
ethoxyquin	F	anti-oxidant	>2417			1726
ethoxysulfuron	H	Inhibition of acetolactate synthase	>2000	>2000		3270
etofenprox	I	Na channel modulator		>2000		>2000
etoxazole	A	Mite growth inhibitors affecting CHS1		>2000		>5000
etridiazole	F	cell peroxidation	560			945
famoxadone	F	Complex III cytochrome bc1 at Qo site, Quinone outside inhibitor	>2250			>5000
fenamidone	F	Complex III cytochrome bc1 at Qo site, Quinone outside inhibitor	>2000			>2028
fenamiphos	N/I	AChE inhibitor	0.8			6.0
fenarimol	F	C ₁₄ -demethylase in sterol biosynthesis, DMI	>2000			2500
fenazaquin	A	Mitochondrial complex I electron transport inhibitor	1747	>2000		134
fenbuconazole	F	C ₁₄ -demethylase in sterol biosynthesis, DMI	>2150			>5000
fenhexamid	F	3-keto reductase, C ₄ -demethylation	>2000			>5000
fenitrothion	I	AChE inhibitor			34.5	330.0
fenoxaprop-P	H	Inhibition of acetyl-CoA carboxylase		2000		>3150
fenoxycarb	I	JH mimics	>7000	>3000		>10000
fenpropidin	F	Δ^{14} -reductase & $\Delta^8 \rightarrow \Delta^7$ -iosmerase in sterol biosynthesis		1899	369	1452
fenproximate	A	Mitochondrial complex I electron transport inhibitor	>2000	>2000		245
fenpyrazamine	F	3-keto reductase, C ₄ -demethylation	>2000			>2000
fipronil	I/A	GABA-gated Cl channel blocker	11.3			92
flazasulfuron	H	Inhibition of acetolactate synthase	>2000	>2250		>5000

flonicamid	I	Chordotonal organ modulator, unidentified target site	>2000	1591-2621		884-1768
florasulam	H	Inhibition of acetolactate synthase			1046	>5000
fluazifop-P-butyl	H	Inhibition of acetyl-CoA carboxylase	>2000	>3960		2451
fluazinam	F	Uncoupler of oxidative phosphorylation	1782			4100
flubendiamide	I	Ryanodine receptor modulator	>2000			>2000
fludioxonil	F	MAP/histidine-kinase in osmotic signal transduction	>2000			>5000
flufenacet	H	Inhibition of very long-chain fatty acid synthesis	1608			569
flufenoxuron	I/A	inhibitor of chitin biosynthesis affecting CHS1	>2000			>3000
flumetralin	PGR		>2000	>2000		>5000
flumioxazin	H	Inhibition of protoporphyrinogen oxidase	>2250	>2250		>5000
fluometuron	H	Inhibition of photosynthesis at PSII serine 264 binders	>2150	2974		>5000
fluopicolide	F	delocalization of spectrin-like proteins	>2250			>5000
fluopyram	F	complex II succinate-dehydrogenase inhibitor (SDHI)	>2000			>2000
fluoxastrobin	F	Complex III cytochrome bc1 at Qo site, Quinone outside inhibitor	>2000			>2000
flupyradifurone	I	nAChR competitive modulator	232		330	>2000
flupyrsulfuron-methyl	H	Inhibition of acetolactate synthase		>2250	>2250	>5000
fluquinconazole	F	C ₁₄ -demethylase in sterol biosynthesis, DMI	>2000	>2000		112
fluroxypyr-meptyl	H	auxin mimics	>2000			>2000
flurprimidol	PGR		>2000	>2000		709
flurtamone	H	Inhibition of phytoene desaturase	>2530			>5000
flusilazole	F	C ₁₄ -demethylase in sterol biosynthesis, DMI		>1590		674
flutianil	F	Unknown MOA	>2250			>2000

flutolanil	F	complex II succinate-dehydrogenase inhibitor (SDHI)	>2000	>2000		>10000
fluvalinate	I	Na channel modulator	>5620			546
fluxapyroxad	F	complex II succinate-dehydrogenase inhibitor (SDHI)	>2000	>2000		>2000
foramsulfuron	H	Inhibition of acetolactate synthase	>2000	>2000		>5000
forchlorfenuron	PGR		>2250			4917
formetanate	A/I	AChE inhibitor		11.5		14.8
fosetyl	F	host plant defense induction	>2000		4997	>7080
fosthiazate	N	AChE inhibitor	10			57.0
fuberidazole	F	β -tubulin assembly in mitosis			>750	>300
gamma-cyhalothrin	I	Na channel modulator	>2000			55
glufosinate	H	Inhibition of glutamine synthase	>2000	>2000		1510.0
glyphosate	H	Inhibition of enol pyruvyl shikimate phosphate synthase	4334			>2000
guazatine	F	multi-site contact activity				57.9
halosulfuron-methyl	H	Inhibition of acetolactate synthase	>2250			7758
hexythiazox	A	Mite growth inhibitors affecting CHS1		>2000		>5000
imazalil	F	C ₁₄ -demethylase in sterol biosynthesis, DMI			510	2000
imazamox	H	Inhibition of acetolactate synthase	>1846	>1950		>5000
imazaquin	H	Inhibition of acetolactate synthase	>2150	>2150	>2000	>5000
imazosulfuron	H	Inhibition of acetolactate synthase	>2250			>5000
imidacloprid	I	nAChR competitive modulator			31	500
indoxacarb	I	Voltage-dependent Na channel blocker	98			268
iodosulfuron	H	Inhibition of acetolactate synthase	>2000	>2000	>2000	2678

ioxynil	H	Inhibition of photosynthesis at PSII histidine 215 binders		62		130
ipconazole	F	C ₁₄ -demethylase in sterol biosynthesis, DMI	962			888
iprodione	F	MAP/histidine-kinase in osmotic signal transduction	>2000	>2000		>2000
iprovalicarb	F	phospholipid biosynthesis and cell wall deposition	>2000			>5000
isofetamid	F	complex II succinate-dehydrogenase inhibitor (SDHI)	>2000			>2000
isoproturon	H	Inhibition of photosynthesis at PSII serine 264 binders	1401			>1826
isopyrazam	F	complex II succinate-dehydrogenase inhibitor (SDHI)	>2000			2000
isoxaben	H	Inhibition of cellulose synthesis	>2000			>5000
isoxaflutole	H	Inhibition of hydroxyphenyl pyruvate dioxygenase	>2150	>2150		>5000
kresoxim-methyl	F	Complex III cytochrome bc1 at Qo site, Quinone outside inhibitor	>2150			>5000
lenacil	H	Inhibition of photosynthesis at PSII serine 264 binders	>2000	>2000		>5000
linuron	H	Inhibition of photosynthesis at PSII serine 264 binders	314			1146
lufenuron	I	inhibitor of chitin biosynthesis affecting CHS1	2000	2000		>2000
malathion	I	AChE inhibitor	359			1778.0
mandestrobin	F	Complex III cytochrome bc1 at Qo site, Quinone outside inhibitor	>2250			>2000
mandiproamid	F	phospholipid biosynthesis and cell wall deposition		>1000		>5000
MCPA	H	auxin mimics	270			962
mecoprop-P	H	auxin mimics	533			704
mefentrifluconazole	F	C ₁₄ -demethylase in sterol biosynthesis, DMI	816	>2000	>2860	>2000
mepanipyrim	F	methionine biosynthesis (proposed)	>2250	>2250		>5000

mesosulfuron-methyl	H	Inhibition of acetolactate synthase	>2000	>2000	>5000
mesotrione	H	Inhibition of hydroxyphenyl pyruvate dioxygenase	>2000		>5000
metaflumizone	I	Voltage-dependent Na channel blocker	>2025	>2025	>5000
metalaxyl-M	F	RNA polymerase I	1180	1466	375
metamitron	H	Inhibition of photosynthesis at PSII serine 264 binders		1302	1183
metazachlor	H	Inhibition of very long-chain fatty acid synthesis	>2000	>2000	>2000
metconazole	F	C ₁₄ -demethylase in sterol biosynthesis, DMI	787		595
methiocarb	I	AChE inhibitor		5	19
methomyl	A/I	AChE inhibitor	24.2		30
methoxyfenozide	I	Ecdysone receptor agonist	>2250		>5000
metobromuron	H	Inhibition of photosynthesis at PSII serine 264 binders		1429	1000-2150
metosulam	H	Inhibition of acetolactate synthase	>2250	>2000	>5000
metrafenone	F	actin/myosin/fimbrin function	>2250	>2250	>5000
metribuzin	H	Inhibition of photosynthesis at PSII serine 264 binders	164		322
metsulfuron-methyl	H	Inhibition of acetolactate synthase		>2510	>5000
milbemectin	I	Glutamate-gated Cl channel allosteric modulator		347	456
molinate	H	Inhibition of very long-chain fatty acid synthesis		389	483
myclobutanil	F	C ₁₄ -demethylase in sterol biosynthesis, DMI	510		1600
napropamide	H	Unknown MOA	>2250		4680
nicosulfuron	H	Inhibition of acetolactate synthase	>2000	>2000	>5000
novaluron	I	inhibitor of chitin biosynthesis affecting CHS1	>2000	>2000	>5000
omethoate	A/I	AChE inhibitor	9.9		22
orthosulfamuron	H	Inhibition of acetolactate synthase	>2000	>2000	>5000

oxadiargyl	H	Inhibition of protoporphyrinogen oxidase		>2000	>802
oxadiazon	H	Inhibition of protoporphyrinogen oxidase	>2150		>5000
oxasulfuron	H	Inhibition of acetolactate synthase	>2250	>2250	>5000
oxydemeton-methyl	I	AChE inhibitor	34	29	48.0
oxyfluorfen	H	Inhibition of protoporphyrinogen oxidase	>2150		>5000
paclobutrazol	F	C ₁₄ -demethylase in sterol biosynthesis, DMI		>2100	490
paraquat	H	PSI electron diversion	176	199	283
penconazole	F	C ₁₄ -demethylase in sterol biosynthesis, DMI		>1590	<2000
pencycuron	F	cell division (unknown site)	>2000		>5000
pendimethalin	H	Inhibition of microtubule assembly		1421	>5000
penflufen	F	complex II succinate-dehydrogenase inhibitor (SDHI)	>4000		>2000
penoxsulam	H	Inhibition of acetolactate synthase		>2000	>5000
penthiopyrad	F	complex II succinate-dehydrogenase inhibitor (SDHI)	>2250		>2000
permethrin	I	Na channel modulator	>5000		>2000
pethoxamid	H	Inhibition of very long-chain fatty acid synthesis	1800		1196
phenmedipham	H	Inhibition of photosynthesis at PSII serine 264 binders		>2500	>8000
picloram	H	auxin mimics		>1944	4012
picolinafen	H	Inhibition of phytoene desaturase	>2250	>2250	>5000
picoxystrobin	F	Complex III cytochrome bc1 at Qo site, Quinone outside inhibitor	>2250		>5000
pinoxaden	H	Inhibition of acetyl-CoA carboxylase		>2250	>5000
pirimicarb	I	AChE inhibitor	20.9	28.5	142
pirimiphos-methyl	I	AChE inhibitor	40		1414.0

primisulfuron-methyl	H	Inhibition of acetolactate synthase	>2150			>5000
prochloraz	F	C ₁₄ -demethylase in sterol biosynthesis, DMI	662	>1954		1023
procymidone	F	MAP/histidine-kinase in osmotic signal transduction	>4092	>4092		>5000
prohexadione	PGR		>2000	>2000		>5000
propaquizafop	H	Inhibition of acetyl CoA carboxylase	>2000			5000
propargite	A	Inhibitor of mitochondrial ATP synthase		>4640		2639
propiconazole	F	C ₁₄ -demethylase in sterol biosynthesis, DMI	>2510	>2510		1500
propoxycarbazone	H	Inhibition of acetolactate synthase	>2000			>5000
proquinazid	F	signal transduction (unknown mechanism)	>2250			4846
prosulfocarb	H	Inhibition of very long-chain fatty acid synthesis	>2250			1820
prosulfuron	H	Inhibition of acetolactate synthase	>2150	1300		986
prothioconazole	F	C ₁₄ -demethylase in sterol biosynthesis, DMI	>2000			>6200
pymetrozine	I	Chordotonal organ TRPV channel modulator	>2000	>2000	>2000	3586
pyraclostrobin	F	Complex III cytochrome bc1 at Qo site, Quinone outside inhibitor	>2000			>5000
pyraflufen-ethyl	H	Inhibition of protoporphyrinogen oxidase	>2000			>5000
pyridaben	I/A	Mitochondrial complex I electron transport inhibitor	>2250	>2250		161
pyridalyl	I	Unknown MOA	>2250			>5000
pyridate	H	Inhibition of photosynthesis at PSII histidine 215 binders	1269			>2000
pyrimethanil	F	methionine biosynthesis (proposed)	>2000	>2000		4149
pyriofenone	F	actin/myosin/fimbrin function	>2000			>2000
pyriproxyfen	I	JH mimics	>1906	>1906		>5000

pyroxsulam	H	Inhibition of acetolactate synthase	>2000	>2000	>2000
quinoxifen	F	signal transduction (unknown mechanism)	>2250		>5000
riflusulfuron	H	Inhibition of acetolactate synthase	>2250	>2250	>5000
rimsulfuron	H	Inhibition of acetolactate synthase	>2250	>2000	>5000
sedaxane	F	complex II succinate-dehydrogenase inhibitor (SDHI)	>2000		2000
silthiofam	F	ATP transport (proposed)	>2250		>5000
sintofen	PGR		>1439	>1439	>5000
S-metolachlor	H	Inhibition of very long-chain fatty acid synthesis	>2194	>2194	2780
spinetoram	I	nAChR allosteric modulator, site I	>2250	>2250	>5000
spinosad	I	nAChR allosteric modulator, site I	>2000	>2000	>2000
spirodiclofen	I/A	Inhibitor of acetyl CoA carboxylase	>2000		>2500
spirotriamat	I/A	Inhibitor of acetyl CoA carboxylase	>2000		>2000
spiroxamine	F	Δ^{14} -reductase & $\Delta^8 \rightarrow \Delta^7$ -iosmerase in sterol biosynthesis	565		500-560
sulcotrione	H	Inhibition of hydroxyphenyl pyruvate dioxygenase		>1350	>5000
sulfosulfuron	H	Inhibition of acetolactate synthase	>2250		>5000
sulfoxaflor	I	nAChR competitive modulator	676		1000
tebuconazole	F	C ₁₄ -demethylase in sterol biosynthesis, DMI	1988		1700
tebufenozide	I	Ecdysone receptor agonist	>2150		>5000
tebufenpyrad	A/I	Mitochondrial complex I electron transport inhibitor	>2000	>2000	320
teflubenzuron	I	inhibitor of chitin biosynthesis affecting CHS1	>2250	>2000	>5000
tefluthrin	I	Na channel modulator	734	>3690	21.8
tembotrione	H	Inhibition of hydroxyphenyl pyruvate dioxygenase	>2250		>2000

tepraloxydim	H	Inhibition of acetyl-CoA carboxylase	>2000		>2000
terbuthylazine	H	Inhibition of photosynthesis at PSII serine 264 binders	1236		1000-1590
tetraconazole	F	C ₁₄ -demethylase in sterol biosynthesis, DMI	132		1031
tetramethrin	I	Na channel modulator	>2250		>5000
thiabendazole	F	β -tubulin assembly in mitosis	>2250		3100
thiacloprid	I	nAChR competitive modulator	2716	49	444
thiamethoxam	I	nAChR competitive modulator	1552		>5000
thiencarbazonemethyl	H	Inhibition of acetolactate synthase	>2000		>2000
thifensulfuronmethyl	H	Inhibition of acetolactate synthase		>2510	>5000
thiodicarb	I	AChE inhibitor	2023		50
thiram	F	multi-site contact activity	930		1800
tolclofosmethyl	F	cell peroxidation	>5000	>5000	>5000
tolyfluanid	F	multi-site contact activity	>2000		>5000
topramezone	H	Inhibition of hydroxyphenyl pyruvate dioxygenase	>2000		>2000
tralkoxydim	H	Inhibition of acetyl-CoA carboxylase			2024 934
transfluthrin	I	Na channel modulator	>1890	>1890	>5000
triadimenol	F	C ₁₄ -demethylase in sterol biosynthesis, DMI	>2000		689
triasulfuron	H	Inhibition of acetolactate synthase	>2150	>2150	>5000
tribenuron	H	Inhibition of acetolactate synthase	>2250		>5000
triclopyr	H	auxin mimics		1698	630
2-butoxyethyl ester	H	auxin mimics	735	>4640	803
tricyclazole	F	reductase in melanin biosynthesis	>2176		237
trifloxystrobin	F	Complex III cytochrome bc1 at Qo site, Quinone outside inhibitor	>2000	>2250	>5000
triflumizole	F	C ₁₄ -demethylase in sterol biosynthesis, DMI	>2510		1057
triflumuron	I	inhibitor of chitin biosynthesis affecting CHS1	561		>5000

trifluralin	H	Inhibition of microtubule assembly	>2250		>5000
trinexapac	PGR		>2250	>2000	4210
triticonazole	F	C ₁₄ -demethylase in sterol biosynthesis, DMI	>2000	>2000	>2000
valifenalate	F	phospholipid biosynthesis and cell wall deposition	>2250	>2250	>5000
warfarin	R		>2000		1.6-323
zoxamide	F	β -tubulin assembly in mitosis	>2000		>5000

a) acaricide; I, insecticide; F, fungicide; H, herbicide; PGR, plant growth regulator; repel, repellent. b) According to Resistance Action Committee of insecticide (IRAC), fungicide (FRAC) & herbicide (HRAC). c) Taken from EFSA Journal (<https://efsa.onlinelibrary.wiley.com>) and US EPA Reregistration Eligibility Decision (<https://archive.epa.gov/pesticides/reregistration/web/html/status.html>).