

Currently Registered Turfgrass Insecticides – By Chemical Class

IRAC Chemical Subgroup	Insecticide Class	Common Name	Original Brand Name	Mode of Action
1A	Carbamate	carbaryl	Sevin®	Acetylcholinesterase inhibitor
1B	Organophosphate	chlorpyrifos	Dursban™	Acetylcholinesterase inhibitor
		acephate	Orthene®	
		trichlorfon	Dylox®	
2B	Phenylpyrazole	fipronil	Choice™	GABA-gated chloride channel antagonist
3	Pyrethroid	bifenthrin	Talstar®	Sodium channel modulator
		cyfluthrin	Tempo®	
		deltamethrin	DeltaGard®	
		lambda-cyhalothrin	Scimitar®	
		permethrin	Astro®	
4A	Neonicotinoid	imidacloprid	Merit®	Nicotinic acetylcholine receptor agonist/antagonist
		clothianidin	Arena™	
		thiamethoxam	Meridian™	
5	Spinosyn	spinosad	Conserve™	Nicotinic acetylcholine receptor agonist (allosteric)
7A	Juvenile Hormone Analogs	methoprene	Extinguish®	Juvenile hormone mimics
7B		fenoxycarb	Award®	
7C		pyriproxyfen	Distance®	
11B2	Microbial	Bacillus thuringiensis kurstaki	Dipel®	Microbial disruptor of insect midgut membrane
18A	Diacylhydrazine	halofenozide	Mach 2™	Ecdysone agonist/molting disruptor
20	Hydramethylnon	hydramethylnon	Amdro®	Mitochondrial complex III electron transport inhibitor
22	Oxadiazine	indoxacarb	Provaunt™	Voltage-dependent sodium channel blocker
28	Anthranilic diamide	chlorantraniliprole	Acelepryn™	Ryanodine receptor modulator

Insecticide Development History



DDT



Cyclodienes



Organophosphates



Carbamates



Photostable Pyrethroids



Neonicotinoids



Diacylhydrazines



Phenylpyrazoles



Spinosyns











Oxadiazines



Anthranilic Diamides



-  Sodium Channel
-  Chloride Channel
-  Acetylcholinesterase
-  Nicotinic Acetylcholine
-  Ecdysone Agonist
-  Nicotinic Acetylcholine
-  Sodium Channel
-  Ryanodine Receptor

→ **First 50 Years**
3 Target Sites

→ **Last 15 Years**
5 Target Sites

Resistance Development

