



Group	Primary Target Site of Action	Chemical Sub-group or Exemplifying Active Ingredient	Landscape Insecticide Active Ingredients (Trade Names)
1A	Acetylcholine esterase inhibitors	Carbamates	carbaryl (Sevin) methiocarb (Mesurol)
		Triazamate	NOT REGISTERED FOR LANDSCAPES
1B		Organophosphates	acephate (Orthene, Orthene Turf, Tree & Ornamental, Pinpoint, PT 1300) chlorpyrifos (DuraGuard, Dursban) diazinon (Diazinon) dimethoate (Cygon) disulfoton (Di-Syston) malathion (Malathion) phosmet (Imidan) trichlorfon (Dylox)
2A	GABA-gated chloride channel antagonists	Cyclodiene organochlorines	lindane (Lindane)
2B		Fipronil	fipronil (Chipco Choice, Over 'n Out, TopChoice)
3	Sodium channel modulators	Pyrethroids	bifenthrin (Attain, Onyx, PT 1800, Talstar) cyfluthrin (Decathalon, Tempo) deltamethrin (Deltagard) lambda-cyhalothrin (Battle, Scimitar) fluvalinate (Mavrik) permethrin (Astro, Permethrin Pro, Pounce, Pramex) resmethrin (Resmethrin)
		Pyrethrins	pyrethrins (Evergreen EC 60-6, Py-Bo, Pyganic, Pyrellin, Pyrenone)
		DDT	NOT REGISTERED FOR LANDSCAPES
4A	Nicotinic Acetylcholine receptor agonists / antagonists	Neonicotinoids	acetamiprid (TriStar) imidacloprid (Bayer Advanced, Marathon, Merit) thiamethoxam (Flagship)
4B		Nicotine	NOT REGISTERED FOR LANDSCAPES
4C		Bensultap	NOT REGISTERED FOR LANDSCAPES
	Cartap	NOT REGISTERED FOR LANDSCAPES	
5	Nicotinic Acetylcholine receptor agonists (not group 4)	Spinosyns	spinosad (Come 'n Get It, Conserve, Eliminate, GF-120, Justice Fire Ant Bait, Spintor)
6	Chloride channel activators	Avermectins, Milbemycins	abamectin (Avid)
7A	Juvenile hormone mimics	Juvenile hormone analogues	kinoprene (Enstar II)
7B		Fenoxycarb	fenoxycarb (Award, Logic, Preclude, Precision)
7C		Pyriproxyfen	pyriproxyfen (Distance)
8A	Compounds of unknown or non-specific mode of action (fumigants)	Methyl bromide	NOT REGISTERED FOR LANDSCAPES
8B		Aluminum phosphide	NOT REGISTERED FOR LANDSCAPES
8C		Sulfuryl fluoride	NOT REGISTERED FOR LANDSCAPES



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9A	Compounds of unknown or non-specific mode of action (selective feeding blockers)	Cryolite	NOT REGISTERED FOR LANDSCAPES
9B		Pymetrozine	pymetrozine (Endeavor)
9C		Flonicamid	NOT REGISTERED FOR LANDSCAPES
10A	Compounds of unknown or non-specific mode of action (mite growth inhibitors)	Clofentezine	NOT REGISTERED FOR LANDSCAPES
10B		Hexythiazox	hexythiazox (Hexygon)
11A1	Microbial disruptors of insect midgut membranes (includes transgenic crops expressing <i>Bacillus thuringiensis</i> toxins)	<i>B.t. var. israelensis</i>	<i>B.t. var. israelensis</i> (Gnatrol)
11A2		<i>B.t. var. sphaericus</i>	NOT REGISTERED FOR LANDSCAPES
11B1		<i>B.t. var. aizawai</i>	NOT REGISTERED FOR LANDSCAPES
11B2		<i>B.t. var. kurstaki</i>	<i>B.t. var. kurstaki</i> (DiPel, Javelin, Foray)
11C		<i>B.t. var. tenebrionensis</i>	NOT REGISTERED FOR LANDSCAPES
12A	Inhibitors of oxidative phosphorylation, disruptors of ATP formation	Diafenthiuron	NOT REGISTERED FOR LANDSCAPES
12B		Organotin miticides	NOT REGISTERED FOR LANDSCAPES
13	Uncoupler of oxidative phosphorylation via disruption of H proton gradient	Chlorfenapyr	NOT REGISTERED FOR LANDSCAPES
		DNOC	NOT REGISTERED FOR LANDSCAPES
14	Inhibition of magnesium-stimulated ATPase	Propargite	NOT REGISTERED FOR LANDSCAPES
15	Inhibitors of chitin biosynthesis, type 0, Lepidopteran	Benzoylureas	diflubenzuron (Dimilin)
16	Inhibitors of chitin biosynthesis, type 1, Homopteran	Buprofezin	buprofezin (Talus)
17	Inhibitors of chitin biosynthesis, type 2, Dipteran	Cyromazine	cyromazine (Citation)
18	Ecdysone agonist / disruptor	Diacylhydrazines	tebufenozide (Confirm)
19	Octopaminergic agonist	Amitraz	NOT REGISTERED FOR LANDSCAPES
20	Site II electron transport inhibitors	Dicofol, Hydramethylnon	dicofol (Kelthane) hydramethylnon (Amdro)
21	Site I electron transport inhibitors	METI acaricides, Rotenone	fenpyroximate (Akari) rotenone (Rotenone)
22	Voltage-dependent sodium channel blocker	Indoxacarb	indoxacarb (Advion)
23	Inhibitors of lipid synthesis	Tetronic acid derivatives	NOT REGISTERED FOR LANDSCAPES
24	Site III electron transport inhibitors	Acequinocyl	NOT REGISTERED FOR LANDSCAPES
		Fluacrypyrim	NOT REGISTERED FOR LANDSCAPES
25	Neuroactive (unknown mode of action)	Bifenazate	bifenazate (Floramite)
26	Unknown mode of action	Azadirachtin	azadirachtin (Aza-Direct, Azatin, BioNeem, Ecozin, Neem-Away, Neemix, Ornazin)

Note: *Beauveria bassiana* (BotaniGard, Naturalis-L), horticultural oils, petroleum oils and insecticidal soaps are registered as insecticides and miticides; however, are not included in the table. They would be good candidates for rotation with the insecticides and miticides listed in the table.