

INSECTICIDE MODE OF ACTION CLASSIFICATION: A key to effective insecticide resistance management

The Insect Resistance Action Committee (IRAC) promotes the use of a Mode of Action (MoA) classification of insecticides as the basis for effective and sustainable insecticide resistance management (IRM). Insecticides are allocated to specific groups based on their target site. The IRAC MoA classification list provides a guide to the selection of insecticides in IRM programs.

In practice, alternations, sequences or rotations of compounds from different MoA groups provide sustainable and effective IRM. This ensures that selection from compounds in the same MoA group is minimized. It is generally essential to ensure that successive generations of the pest are not treated with compounds from the same MoA group.

Local expert advice should always be followed with regard to spray windows and timings.

IRAC website: www.irc-online.org

INSECTICIDES

Group	Mode of Action	Insecticide Class	Insecticide Common Name	Original Brand Name
1A	Acetylcholinesterase Inhibitor	Carbamate	Carbaryl	Sevin
1B	Acetylcholinesterase Inhibitor	Organophosphate	Chlorpyrifos Acephate Trichlorfon	Dursban Orthene Dylox
2B	GABA-gated chloride Channel Antagonist	Phenylpyrazole	Fipronil	Maxforce
3	Sodium Channel Modulator	Pyrethroid	Bifenthrin Cyfluthrin Deltamethrin Lambda-cyhalothrin	Talstar Tempo DeltaGard Scimitar
4A	Nicotinic Acetylcholine Receptor Agonist/Antagonist	Neonicotinoid	Imidacloprid Clothianidin Thiamethoxam	Merit Arena Meridian
5	Nicotinic Acetylcholine Receptor Agonist (Allosteric)	Spinosyn	Spinosad	Conserve
6	Chloride Channel Activators	Avermectins	Abamectin	Avid
7B 7C	Juvenile Hormone Mimics	Juvenile Hormone Analogs	Fenoxycarb Pyriproxyfen	Award Distance
11B2	Microbial Disruptor of Insect Midgut Membrane	Microbial	Bacillus Thuringiensis Kurstaki	Dipel
18A	Ecdysone Agonist/Molting Disruptor	Diacthydrazine	Halofenozide	Mach 2
20	Mitochondrial Complex III Electron Transport Inhibitor	Hydramethylnon	Hydramethylnon	Amdro
22	Voltage-Dependent Sodium Channel	Oxadiazine	Indoxacarb	Advion, Provaunt
28	Ryanodine receptor modulator	Anthranilic diamide	hlorantraniliprole	Acelepryn



ACELEPRYN

DuPont

A.I. Chlorantraniliprole

DuPont™ Acelepryn™ insecticide is an entirely new insecticide class with a novel mode of action. Studies prove that it delivers superior results with the lowest application rate (lb ai/acre) ever utilized for white grub control.

D13882998 .5 Gallon



BIFENTHRIN UP STARGOLD

Prokoz

A.I. Bifenthrin

Bifenthrin multi-insecticide golf course / nursery formulation is effective for controlling many kinds of insects. This product mixes readily with water.

PK10583 T&O, 3/4 Gallon



ALLECTUS G

Bayer Environmental Science

A.I. Imidacloprid + Bifenthrin

For general insect control in turfgrass areas including athletic fields and park and residential, commercial, industrial, institutional and recreational lawns. Not for use on golf courses or sod farms.

3844017 T&O, 50 lb. Bag
3844068 GC, 50 lb. Bag (RUP)
3847962 GC, 1 Gallon Jug (RUP)



DUOCIDE DG PRO

The Andersons

A.I. Bifenthrin + Carbaryl

For control of selected surface and subsurface pests on any turfgrass site including golf courses and sod farms and control of pests in and around flower beds, ornamental plantings and around buildings.

AGCDGDU4 40 lb. Bag



ARENA 50 WDG + .25G

Valent

A.I. Clothianidin

Arena® Insecticide is the only preventative and curative grub control product proven to provide maximum application timing flexibility.

66330-40 50 WDG, 40 oz. Bottle
61427.190 .25G, 25 lb. Bag



DYLOX 420 SL

Bayer Environmental Science

A.I. Trichlorfon

Dylox 420 SL is a new liquid formula for turf and ornamentals. Dylox 420 SL is registered for use on turf (all species, landscape and recreational area sites), flowers, shrubs and trees.

79105568 2.5 Gallon



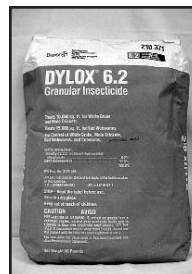
AZATROL®

PBI Gordon

A.I. Azadirachtin

A botanical product for control of insects on indoor and outdoor ornamental shrubs, flowers, trees, vegetables and plants. Azatrol is a unique insecticide formulation containing azadirachtin that is very effective on white flies, leafrollers, aphids, mites and many other insects.

6611076 1 Gallon



DYLOX 6.2%

Bayer Environmental Science

A.I. Trichlorfon

Dylox 6.2 is a fast-acting granular curative product for grub control. Applications of Dylox in most areas should be made after August 15 or whenever grubs are found. Dylox works within 24 hours, which makes it an ideal choice for curative treatment. Dylox also controls mole crickets, sod webworms and cutworms. Dylox works immediately after irrigation or rainfall.

210371 30 lb. Bag



FLORA-MEK

Prokoz

A.I. Abamectin

Flora-Mek offers proven protection against spider mites and leafminers. Plus, it effectively suppresses aphids, thrips, and whiteflies, making it an important part of a sound IPM program. Through translaminar activity, it penetrates the plant tissue and deposits a reservoir of active ingredient inside the leaf cuticle.

26784 1 Quart



MERIDIAN

Syngenta

A.I. Thiamethoxam

Meridian™ insecticide provides turf managers with an unprecedented degree of control and application flexibility in managing a broad spectrum of grubs and insects on their turf.

23418 .33G, 40 lb. Bag
35036 25 WG, 4 x 17 oz. Case
37504 25 WG, 4 x 102 oz. Case



FORBID 4F MITICIDE

Bayer

A.I. Spiromesifen

Forbid is a new class of miticide with a totally new MOA (mode of action). Forbid is translaminar – it moves from the top of the leaf to the bottom straight through the leaf, it kills all life stages from egg to adult, and has no known resistance. Forbid gives a long residual of 4-8 weeks, and with a “Caution” rating is a safer product for applicators.

3944704 Case (6 x 8 oz.)



MERIT G

Bayer Environmental Science

A.I. Imidacloprid

Merit is a broad-spectrum, systemic granular insecticide that is effective at low use rates on turfgrass and ornamentals. The active ingredient in Merit provides strong residual activity and superior biological performance. Its low use rate helps reduce risk to applicators and non-target organisms. Merit will provide residual soil insect control 4 months or longer in turf under normal conditions.

216541 0.5 G, 30 lb. Bag
217190 2.5 G, 4 lb. Jug



INSECTICIDE III DG PRO

The Andersons

A.I. Chlorpyrifos

Andersons Insecticide III is a granular insecticide that controls chinch bugs, sod webworms, flea beetles (in dichondras), cutworms and other surface insects. Pulp carrier. Small particle.

AGC8222-1 28.1 lb. Bag



MERIT 75 WSP

Bayer Environmental Science

A.I. Imidacloprid

Merit 75WSP is a systemic insecticide that is effective at low rates. The active ingredient in Merit provides strong residual activity and superior biological performance. The wettable powder in water-soluble packets make mixing simple and package disposal easy.

216512 4 x 4 x 1.6 oz.
79229356 Mini Drum (110 x 1.6 oz.)



MACH 2

Dow Agro Sciences

A.I. Halofenozide

Mach 2 insecticide mimics the actions of a natural insect hormone which induces the molting and metamorphosis process in insects.

1757-025 2.5 Gallon



PROSECT .15G DG PRO

The Andersons

A.I. Bifenthrin

For use to control Ants (including Imported Fire Ants), mole crickets and other insect pests on lawns in landscaped areas and perimeters around residential, institutional, public, commercial and industrial buildings, parks, recreational areas, golf courses, sod farms and athletic fields.

AGCDGBF5 50 lb. Bag



PROVAUNT

DuPont

A.I. Indoxacarb

Provaunt® insecticide is a water dispersible granular that may be applied as a foliar or broadcast spray to control lepidopterous larvae and certain other pests on landscape and recreational (including golf course) turfgrass and landscape ornamentals. Nonrup - cutworm control for golf course greens.

D12762606 10 oz. Bottle



TALSTAR ONE

FMC

A.I. . Bifenthrin

Talstar One® Multi-Insecticide controls a wide spectrum of insects and mites on trees, shrubs, foliage plants, non-bearing fruit and nut trees, and flowers in greenhouses, interiorscapes including hotels, shopping malls, office buildings, etc.

10054275 T&O, 1 Pint
2441956 0-0-7 w/.73%, 30 lb. Bag



SAFARI 20SG

Valent

A.I. Dinotefuran

Safari™ 20 SG Insecticide can be applied as a foliar spray or broadcast spray for insect control in ornamental plants in commercial or residential landscapes, greenhouses & nurseries.

69712.430 3 lb. Bottle



TEMPO ULTRA

Bayer Environmental Science

A.I. B-Cyfluthrin

Tempo Ultra WSP is a broad spectrum control of crawling, flying, and wood-infesting insect pests on indoor & outdoor surfaces, as well as insect pests of trees, landscape ornamentals and residential and commercial lawns.

3551842 4 x 8 x 50 Grams
4196332 1 Bottle 240 ml



SCIMITAR CS & GC

Syngenta

A.I. Lambda-cyhalothrin

Controls insect pests on ornamentals and lawns in landscaped areas around residential, institutional, public, commercial, and industrial buildings, parks, recreational areas and athletic fields.

73419 GC, 1 Quart (RUP)
73420 CS, T&O, 1 Pint



TENGARD SFR

UPI

A.I. Permethrin

For use as an insecticide on ornamentals grown in greenhouse and interiorscapes, for perimeter insect control on lawns, ornamental trees and shrubs around residential, institutional, public, commercial and industrial buildings, parks, recreational areas and athletic fields.

SFR125 1.25 Gallon Jug
SFR55 55 Gallon Drum



SEVIN SL

Bayer/Prokoz

A.I. Carbaryl

SEVIN® brand 4F carbaryl insecticide sets the standard for broad-spectrum control in the food crop, grain crop, forestry, home-use pesticide and tobacco markets. It offers a host of advantages over other insecticides, ease of application, short PHI, no phytotoxicity, and 12-hour re-entry. Plus, Sevin is one of the most environmentally responsible pesticides you can use.

25872 2.5 Gallon



ZENITH

Bayer/Prokoz

A.I. Imidacloprid

Zenith Insecticide is a broad spectrum, systemic insecticide that is effective at extremely low use rates. Zenith delivers outstanding control of a variety of turf and ornamental insects. It has an active ingredient that provides strong residual activity and superior biological performance. Even soil application to shrubs and trees provides long-lasting control of labeled insect pests.

79404506 75WSP, Case (4 x 4 x 1.6 oz.)
4321312 2F, 40 oz. Bottle
03843894 .5G, 30 lb. Bag

For a copy of product MSDS sheet, visit our website: www.reinders.com