INSECTICIDE CLASSIFICATION

Repeated use of insecticides with the same mode of action can result in the development of resistant insect populations.

Take ACTION Insect-Resistance Management

THIS CHART CLASSIFIES INSECTICIDES LABELED FOR USE IN CORN AND/OR SOYBEANS.

by MODE OF ACTION (MOA)

This chart groups insecticides by their modes of action to assist you in selecting insecticides **1)** to maintain greater diversity in insecticide use and **2)** to rotate among effective insecticides with different modes of action to delay the development of insecticide resistance.

GROUP #	MODE OF ACTION	CHEMICAL FAMILY	ACTIVE INGREDIENT	PRODUCT EXAMPLES (Trade Name)
NERVE AND MUSCLE ACTION				
1	Acetylcholinesterase inhibitors	1A carbamates	aldicarb	*AgLogic*
			carbaryl	*Carbaryl, Sevin 4F, Sevin XLR Plus*
			methomyl	*Lannate LV*
		1B organophosphate	acephate	*Acephate 90 PRILL, Acephate 90WDG, Acephate 97, Acephate 97UP, Orthene 97*
			chlorpyrifos	*Chlorpyrifos 4E AG, Govern 4E, Hatchet, Nufos 4E, Vulcan, Warhawk, Whirlwind, Yuma 4E*
			chlorethoxyfos	*component of SmartChoice 5G*
			dimethoate	*Dimate 4E, Dimethoate 4E , Dimethoate 4EC, Dimethoate 400*
			malathion	*Cheminova Malathion 57%, Fyfanon ULV AG, Malathion 5, Malathion 57EC*
			phorate	*Thimet 20G Lock n Load, Thimet 20G SmartBox*
			tebupirimphos	*component of Aztec, component of Defcon*
			terbufos	*Counter 15G SmartBox, Counter 15G Lock n Load, Counter 20G SmartBox, Counter 20G Lock n Load*
2	GABA-gated chloride channel blockers	phenylpyrazoles (fiproles)	fipronil	*Regent 4SC*
3	Sodium channel modulators	pyrethroids, pyrethrins	*alpha*-cypermethrin	*Fastac CS, Fastac EC*
			beta-cyfluthrin	*Baythroid XL*
			bifenthrin	*Bifender FC, Bifenthrin 2EC, Bifenture EC, Brigade 2EC, Capture LFR, Discipline 2EC, Ethos XB, Fanfare 2EC, Sniper, Sniper Helios, Sniper LFR, Tundra EC*
			cyfluthrin	*Tombstone, Tombstone Helios*
			deltamethrin	*Battalion 0.2EC, Delta Gold*
			esfenvalerate	*Asana XL*
			gamma-cyhalothrin	*Declare, Proaxis*
			lambda-cyhalothrin	*Grizzly Too, Grizzly Z, Kendo, Nufarm Lambda Cyhalothrin 1EC, Lambda-Cy EC, LambdaStar, Lambda-T, Lamcap, Province, Silencer, Silencer VXN, Warrior II*
			permethrin	*Ambush, Ambush 25W, Arctic 3.2EC, Kernel Guard Supreme*, PermaStar AG, Permethrin, Permethrin 3.2EC, Perm-Up 3.2EC, Pounce 1.5G*
			tefluthrin	*Force 3G, Force 3G SmartBox, Force 6.5G, Force Evo, Precept*
			zeta-cypermethrin	*Mustang Maxx, Mustang Maxx EC, Respect EC*
4	Nicotinic acetylcholine receptor agonists	4A neonicotinoids	acetamiprid	*Assail 30SG, Assail 70WP, Intruder Max 70WP*
			clothianidin	*Belay, Inovate*, Intego Suite Soybeans*, NipsIt Inside*, Poncho 600*, Poncho/VOTiVO*, Poncho/ VOTiVO 2.0*
			imidacloprid	*Acceleron*, Admire Pro, Alias 4F, AmTide Imidacloprid 2F, Attendant 480FS*, Attendant 600*, Dyna-Shield Imidacloprid 5*, Enhance AW*, Gaucho 600*, Kickstart*, Nuprid 2SC, Nuprid 4F Max, Prey 1.6, Senator 600FS*, Sherpa, Wrangler*
			thiamethoxam	*Cruiser 5FS*, CruiserMaxx*, CruiserMaxx Vibrance*, Upshot Soybeans**
		4C sulfoxamines	sulfoxaflor	*Closer, Transform*
		4D butenolides	flupyradifurone	*Sivanto 200 SL, Sivanto Prime*
5	Nicotinic acetylcholine receptor allosteric activators	spinosyns	spinetoram	*Delegate, Radiant SC*
			spinosad	*Blackhawk, Entrust, Tracer*
6	Glutamate-gated chloride channel (GluCl) allosteric modulators	avermectins, milbemycins	abamectin	*Agri-Mek SC, Avicta 500FS**
9	Chordotonal organ TRPV channel modulators	pyropenes	afidopyropen	*Sefina*
22	Voltage-dependent sodium channel blockers	indoxacarb	indoxacarb	*Steward EC*
28	Ryanodine receptor modulators	diamides	chlorantraniliprole	*Coragen, Prevathon, Vantacor*
			cyantraniliprole	*Fortenza**
GROWTH REGULATION				
10	Mite growth inhibitors	clofentezine, hexythiazox	hexythiazox	*Onager*
		etoxazole	etoxazole	*Zeal SC, Zeal WDG*
15	Inhibitors of chitin biosynthesis	benzoylureas	diflubenzuron	*Dimilin 2L*
			novaluron	*Diamond*
18	Ecdysone receptor agonists	diacylhydrazines	methoxyfenozide	*Intrepid 2F*
23	Inhibitors of acetyl CoA carboxylase	tetronic and tetramic acid derivatives	spiromesifen	*Oberon 2SC*
			spirotetramat	*Movento*
INSECT MIDGUT				
11	Microbial disruptors of insect midgut membranes	Bacillus thuringiensis (Bt)	Bacillus thuringiensis (Bt), cry toxin	*Agree WG, Biobit HP, DiPel DF, DiPel ES, Javelin, XenTari DF*
ENERGY METABOLISM				
12	Inhibitors of mitochondrial ATP synthase	propargite	propargite	*Comite II*

by PREMIX

This section lists premix insecticides by their trade names so you can identify the premix's component insecticides and their respective site of action groups. Refer to the **Mode of Action** section on the left for more information.

PREMIX (Trade Name)	ACTIVE INGREDIENT	GROUP #
AVICTA COMPLETE CORN*	abamectin	6
	thiamethoxam	4
AVICTA COMPLETE BEANS 500*	abamectin	6
	thiamethoxam	4
AZTEC	tebupirimphos	1
	cyfluthrin	3
BESIEGE	*lambda*-cyhalothrin	3
	chlorantraniliprole	28
BOLTON	chlorpyrifos	1
	gamma-cyhalothrin	3
BRIGADIER	bifenthrin	3
	imidacloprid	4
COBALT	chlorpyrifos	1
	gamma-cyhalothrin	3
COBALT ADVANCED	chlorpyrifos	1
	lambda-cyhalothrin	3
DEFCON 2.1G	tebupirimphos	1
	cyfluthrin	3
DOUBLETAKE	diflubenzuron	15
	lambda-cyhalothrin	3
ELEVEST	chlorantraniliprole	28
	bifenthrin	3
ENDIGO ZC	*lambda*-cyhalothrin	3
	thiamethoxam	4
HERO	*zeta*-cypermethrin	3
	bifenthrin	3
INTREPID EDGE	methoxyfenozide	18
	spinetoram	5
JUSTICE	acetamiprid	4
	bifenthrin	3
KILTER	imidacloprid	4
	lambda-cyhalothrin	3
LEVERAGE 360	imidacloprid	4
	beta-cyfluthrin	3
MATCH-UP	chlorpyrifos	1
	bifenthrin	3
SMARTCHOICE 5G	chlorethoxyfos	1
	bifenthrin	3
STALLION	*zeta*-cypermethrin	3
	chlorpyrifos	1
STEED	*zeta*-cypermethrin	3
	bifenthrin	3
SKYRAIDER SWAGGER	bifenthrin	3
	imidacloprid	4
TRIPLE CROWN	imidacloprid	4
	zeta-cypermethrin	3
	bifenthrin	3
TUNDRA SUPREME	chlorpyrifos	1
	bifenthrin	3
VOLIAM XPRESS	*lambda*-cyhalothrin	3
	chlorantraniliprole	28

Take Action is endorsed by the following organizations:

For more information and links to additional resources, visit **www.IWillTakeAction.com**

Products denoted with an * are insecticide seed treatments. These seed treatments may also include fungicides. Please refer to the Take Action Fungicide Classification Chart for fungicide MOA classification. Fungicide active ingredients in these seed treatments are not listed on this chart.

Products listed in this chart are not necessarily labeled for use in all crops or use in all states. Consult the product label for registration and use information. Read and adhere to all label application instructions. This is not a comprehensive list and may exclude insecticides from the product examples.

Technical editors for this poster include Jeremy Greene, Clemson University; Robert Koch, University of Minnesota; Fred Musser, Mississippi State University; and Nick Seiter, University of Illinois.

This chart was developed with funding from the soy checkoff.

The United Soybean Board and all Take Action partners, including the companies mentioned above, neither recommend nor discourage the implementation of any advice contained herein, and are not liable for the use or misuse of the information provided.

©2021 United Soybean Board. May 2021 [61127-1 5/21]