

HERBICIDE CLASSIFICATION



Repeated use of herbicides with the same site of action can result in the development of herbicide-resistant weed populations.

by MODE OF ACTION (MOA) (effect on plant growth)

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

SITE-OF-ACTION GROUP ¹	SITE OF ACTION	NUMBER OF RESISTANT WEED SPECIES IN U.S.			
		CHEMICAL FAMILY	ACTIVE INGREDIENT	PRODUCT EXAMPLES (TRADE NAME)	
LIPID SYNTHESIS INHIBITORS					
1	ACCASE INHIBITORS (acetyl CoA carboxylase)	14	Aryloxyphenoxypropionate (fops)	clodinafop	Discover NG
				cyhalofop	Clincher
				fenoxaprop	Ricestar HT, others
				fluzafop	Fusilade DX
				quizalofop	Assure II, others
			Cyclohexanedione (dims)	clathedim	Select Max, others
				sethoxydim	Poast, Poast Plus
			Phenylpyrazoline	pinoxaden	Axial XL
AMINO ACID SYNTHESIS INHIBITORS					
2	ALS INHIBITORS (acetolactate synthase)	53	Imidazolinone	imazamox	Raptor, Beyond
				imazapic	Plateau
				imazapyr	Arsenal
				imazaquin	Scepter
				imazethapyr	Pursuit, Newpath
			Pyrimidinyl benzoates	bispyribac	Regiment
				pyrithiobac	Staple
				bensulfuron	Landax
				chlorimuron	Classic
				chlorsulfuron	Glean
				halosulfuron	Permit, Sandea
				iodosulfuron	Autumn
				mesosulfuron	Osprey
				metsulfuron	Ally
				nicosulfuron	Accent 0, Zest
			Sulfonurea	orthosulfamuron	Strada
				primisulfuron	Beacon
				proisulfuron	Peak
				rimisulfuron	Matrix, Resolve
				sulfosulfuron	Outrider
				thifensulfuron	Harmony
				triasulfuron	Amber
				tribenuron	Express
				trifloxysulfuron	Envoke
				trifluralin	UpBeet
			Triazolinones	flucarbazone	Everest, Pre-Pare
				propoxycarbazone	Olympus
				thiencarbazone	Varro
				cloransulam	FirstRate
			Triazolopyrimidine - Type 1	florasulam	component of Orion, Quelex, Starane Flex
				flumetsulam	Python
				penoxsulam	Grasp
			Triazolopyrimidine - Type 2	pyrasulam	PowerFlex HL
9	EPSP SYNTHASE INHIBITOR (5-enolpyruvyl-shikimate-3-phosphate)	18	Glycine	glyphosate	Roundup, several others

GROWTH REGULATORS				
4	SYNTHETIC AUXINS (TIR1, AFB1-5 and unknown auxin receptors)	11	6-Arylpicolinates	florpyrauxifen <i>Loyant</i>
				halauxifen <i>Elevore</i>
			Benzate	dicamba <i>Banvel, Clarity, DIFlexx, Engenia*, Xtendimax*, others</i>
			Phenoxy carboxylate	2,4-D <i>2,4-D, Enlist One, others</i>
				MCPA <i>MCPA</i> , others
			Pyridine carboxylate	aminopyralid <i>Milestone</i>
				clopyralid <i>Stinger</i>
				halauxifen <i>Elevore</i>
				fluroxypyr <i>Starane Ultra</i>
				triclopyr <i>Garlon, Remedy Ultra</i>
			Quinolone carboxylate	quinclorac <i>Facet</i>
19	AUXIN TRANSPORT INHIBITOR	0	Aryl carboxylate	diflufenopyr <i>component of Status</i>

PHOTOSYNTHESIS INHIBITORS				
5	PHOTOSYSTEM II INHIBITORS (D1 Serine 264 binders and non-histidine 215 binders)	28	Amide	propanil <i>SuperWham</i>
				atrazine <i>AAtrex</i> , others
			Triazine	ametryn <i>Evik</i>
				prometon <i>Pramitol</i>
				prometryn <i>Caparol</i>
				simazine <i>Princep</i>
			Triazinone	hexazinone <i>Velpar</i>
				metribuzin <i>Metribuzin</i> , others
			Triazolinone	amcarbazone <i>Xanerate</i>
			Uracil	terbacil <i>Sinbar</i>
			Urea	diuron <i>Direx</i> , <i>Karmex</i>
				fluometuron <i>Cotoran</i>
linuron <i>Lorox</i> , <i>Linex</i>				
tebutiuron <i>Spike</i>				
6	PHOTOSYSTEM II INHIBITORS (D1 Histidine 215 binders)	1	Benzothiadiazine	bentazon <i>Basagran</i> , others
			Nitrile	bromoxynil <i>Maestro</i> , <i>Hoxy</i> , others
			Phenyl pyridazine	pyridate <i>Tough</i>

PIGMENT INHIBITORS				
12	PHYTOENE DESATURASE (PDS) INHIBITORS	1	Diphenyl heterocycle	fluridone <i>Brake, Sonar</i>
			N-Phenyl heterocycle	norfurazone <i>Solicam</i>
			Phenyl ether	diflufenican <i>Convinto*</i>
13	DOXP SYNTHASE INHIBITOR (1-DEOXY-D-XULOSE 5-PHOSPHATE)	2	Isoxazolidinone	clomazone <i>Command 3ME</i>
27	HPPD INHIBITORS	3	Isoxazole	isoxaflutole <i>Alite 27, Balance Flexx</i>
				pyrasulfotole <i>component of Huskie</i>
			Pyrazole	topramezone <i>Armezon, Impact</i>
				tolpyralate <i>Shieldex</i>
			Triketone	bicyclopyrone <i>Optogen</i>
				mesotrione <i>Callisto</i>
				tembotrione <i>Laudis</i>

CELL MEMBRANE DISRUPTERS				
14	PPO INHIBITORS	7	Diphenyl ether	acifluorfen <i>Ultra Blazer</i>
				fomesafen <i>Flexstar, Reflex</i> , others
				lactofen <i>Cobra, Phoenix</i>
				epyriflencil <i>Rapiditi*</i>
				flumiclorac <i>Resource</i>
			N-Phenylimide	flumioxazin <i>Valor, Chateau</i> , others
				fluthiacet <i>Cadet</i>
				saflufenacil <i>Sharpen</i>
				tiatfenacil <i>Reviton, Gamma</i>
				carfentrazone <i>Aim</i>
			N-Phenyltriazolinone	sulfentrazone <i>Spartan</i>
22	PHOTOSYSTEM I ELECTRON DIVERter	6	Pyridinium	diquat <i>Regione</i>
				paraquat <i>Gramoxone SL</i>

SEEDLING ROOT GROWTH INHIBITORS				
3	MICROTUBULE ASSEMBLY INHIBITORS	6	Benzamide	pronamide <i>Kerb</i>
				ethalfuralin <i>Sanolan</i>
			Dinitroaniline	pendimethalin <i>Prowl H₂O</i> , others
				trifluralin <i>Treflan</i> , others
			Pyridine	dithiopyr <i>Dimension</i>

SEEDLING SHOOT GROWTH INHIBITORS				
15	VERY LONG-CHAIN FATTY ACID SYNTHESIS INHIBITORS	8	Benzofuran	ethofumesate <i>Nortron</i>
				acetochlor <i>Harness, Surpass, Warrant</i> , others
			α-Chloroacetamide	dimethenamid-P <i>Outlook</i>
				s-metolachlor <i>Dual Magnum</i> , others
			Isoxazoline	pyrasulfone <i>Zidua</i>
			α-Oxycetamide	flufenacet <i>Define</i>
				cycloate <i>Ro-Neet</i>
				EPIC <i>Eradicane, Eptam</i>
				thiobencarb <i>Bolero</i>
				triallate <i>Far-Go</i>
			Thiocarbamate	
29	CELLULOSE BIOSYNTHESIS INHIBITORS	3	Aykalazine	indaziflam <i>Alion, Esplanade, Rezilon</i>
			Benzamide	isoxaben <i>Gallery, Trellis</i>

UNDEFINED				
0	UNKNOWN	1	Amide	nagropamide <i>Devrinal</i>
			Arsenical	MSMA <i>MSMA</i>



¹ Site of Action Group numbers follow the revised 2024 Herbicide Resistance Action Committee (HRAC) classification.
*Indicates product is not registered for use at the time of printing.
Check for a label and Material Safety Data Sheet at www.cdms.net to confirm status. This chart contains some restricted use pesticides. Always consult label prior to use.
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by PREMIX

This chart lists premix herbicides alphabetically by their trade names so you can identify the premix's component herbicides and their respective site-of-action groups. Refer to the **Site of Action** chart on the left for more information.

PREMIX	COMPONENT	
	ACTIVE INGREDIENT	TRADE NAME
ACURON	bicyclopyrone	<i>Optogen</i>
	mesotrione	<i>Callisto</i>
	atrazine	<i>AAtrex</i>
	s-metolachlor	<i>Dual II Magnum</i>
	bicyclopyrone	<i>Optogen</i>
ACURON FLEXI	mesotrione	<i>Callisto</i>
	s-metolachlor	<i>Dual II Magnum</i>
	bicyclopyrone	<i>Optogen</i>
	mesotrione	<i>Callisto</i>
	s-metolachlor	<i>Dual Magnum</i>
ACURON GT	glyphosate	<i>Harmony</i>
	thifensulfuron	<i>Express</i>
	tribenuron	<i>Express</i>
	thifensulfuron	<i>Harmony</i>
	tribenuron	<i>Express</i>
AFFINITY BROADSPEC (Affinity TankMix)	flumioxazin	<i>Valor</i>
	thifensulfuron	<i>Harmony</i>
	tribenuron	<i>Express</i>
	flumioxazin	<i>Valor</i>
	thifensulfuron	<i>Harmony</i>
ALLY EXTRA	tribenuron	<i>Express</i>
	metsulfuron	<i>Ally</i>
	pyrasulfone	<i>Zidua</i>
	carfentrazone	<i>Aim</i>
	pyrasulfone	<i>Zidua</i>
ANTHEM FLEX	pyrasulfone	<i>Zidua</i>
	carfentrazone	<i>Aim</i>
	pyrasulfone	<i>Zidua</i>
	fluthiacet	<i>Cadet</i>
	topramezone	<i>Armezon</i>
ARMEZON PRO	dimethenamid-P	<i>Outlook</i>
	sulfentrazone	<i>Spartan</i>
	imazethapyr	<i>Pursuit</i>
	sulfentrazone	<i>Spartan</i>
	pyrasulfone	<i>Zidua</i>
AUTHORITY ASSIST	sulfentrazone	<i>Spartan</i>
	cloransulam	<i>FirstRate</i>
	sulfentrazone	<i>Spartan</i>
	pyrasulfone	<i>Zidua</i>
	sulfentrazone	<i>Spartan</i>
AUTHORITY EDGE	sulfentrazone	<i>Spartan</i>
	cloransulam	<i>FirstRate</i>
	sulfentrazone	<i>Spartan</i>
	pyrasulfone	<i>Zidua</i>
	sulfentrazone	<i>Spartan</i>
AUTHORITY FIRST	sulfentrazone	<i>Spartan</i>
	cloransulam	<i>FirstRate</i>
	sulfentrazone	<i>Spartan</i>
	pyrasulfone	<i>Zidua</i>
	sulfentrazone	<i>Spartan</i>
AUTHORITY SUPREME	sulfentrazone	<i>Spartan</i>
	cloransulam	<i>FirstRate</i>
	sulfentrazone	<i>Spartan</i>
	pyrasulfone	<i>Zidua</i>
	sulfentrazone	<i>Spartan</i>
AUTHORITY XL	chlorimuron	<i>Classic</i>
	iodosulfuron	<i>Autumn</i>
	thiencarbazone	<i>Varro</i>
	pinoxaden	<i>Axial XL</i>
	fenoxaprop	<i>Ricestar</i>
AUTUMN SUPER	pinoxaden	<i>Axial XL</i>
	fluroxypyr	<i>Starane</i>
	rimisulfuron	<i>Resolve</i>
	thifensulfuron	<i>Harmony</i>
	s-metolachlor	<i>Dual II Magnum</i>
BICEP II MAGNUM (Bicep Lite II Magnum)	atrazine	<i>AAtrex</i>
	s-metolachlor	<i>Dual Magnum</i>
	metribuzin	<i>Metribuzin</i>
	s-metolachlor	<i>Dual Magnum</i> </