

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
				flusilafop	Fusilade DX
				quizalofop	Assure II, others
Cyclohexanedione (dims)	clethodim	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			
Sulfonylurea	bensulfuron	Londax			
	chlorimuron	Classic			
	chlorsulfuron	Glean			
	halosulfuron	Permit, Sandea			
	iodosulfuron	Autumn			
	mesosulfuron	Osprey			
	metsulfuron	Ally			
	nicosulfuron	Accent Q, Zest			
	orthosulfamuron	Strada			
	primisulfuron	Beacon			
	prosofuron	Peak			
	rimsulfuron	Matrix, Resolve			
	sulfosulfuron	Outrider			
	thifensulfuron	Harmony			
	triasulfuron	Amber			
	tribenuron	Express			
	triflousulfuron	Envoke			
triflussulfuron	UpBeet				
Triazolinones	flucarbazone	Everest, Pre-Pare			
	propoxycarbazone	Olympus			
	thiencarbazone	Varro			
Triazolopyrimidine - Type 1	cloransulam	FirstRate			
	florasulam	component of Orion, Quelex, Starane Flex			
Triazolopyrimidine - Type 2	flumetsulam	Python			
	penoxosulam	Grasp			
	pyroxulam	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 halauxifen	<i>Loyant</i> <i>Elevore</i>			
			Benzoate	dicamba	<i>Banvel, Clarity, DiFlexx, others</i>			
			Phenoxy carboxylate	2,4-D MCPA	<i>2,4-D, Enlist One, others</i> <i>MCPA, others</i>			
			Pyridine carboxylate	aminopyralid clopyralid halauxifen	<i>Milestone</i> <i>Stinger</i> <i>Elevore</i>			
			Pyridyloxy carboxylate	fluroxypyr triclopyr	<i>Starane Ultra</i> <i>Garlon, Remedy Ultra</i>			
			Quinoline carboxylate	quinclorac	<i>Facet</i>			
			19	AUXIN TRANSPORT INHIBITOR	0	Aryl carboxylate	diflufenyzpr	<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, others</i>	
				ametryn	<i>Evik</i>	
				prometon	<i>Pramitol</i>	
				prometryn	<i>Caparol</i>	
			Triazine	simazine	<i>Princep</i>	
				Triazinone	hexazinone	<i>Velpar</i>
					metribuzin	<i>Metribuzin, others</i>
				Uracil	terbacil	<i>Sinbar</i>
				Urea	diuron	<i>Direx, Karmex</i>
fluometuron	<i>Cotaran</i>					
linuron	<i>Lorox, Linex</i>					
tebuthiuron	<i>Spike</i>					
6	PHOTOSYSTEM II INHIBITORS (D1 Histidine 215 binders)	1	Benzothiadiazinone	benfazon	<i>Basagran, others</i>	
				Nitrile	bromoxynil	<i>Maestro, Mox, others</i>
				Phenyl pyridazine	pyridate	<i>Tough</i>

NITROGEN METABOLISM INHIBITOR					
10	GLUTAMINE SYNTHETASE INHIBITOR	3	Phosphinic acid	glufosinate	<i>Liberty, Rely, others</i>
PIGMENT INHIBITORS					
12	PHYTOENE DESATURASE (PDS) INHIBITORS	1	Diphenyl heterocycle	fluridone	<i>Brake, Sonar</i>
			N-Phenyl heterocycle	norflurazon	<i>Solicam</i>
			Phenyl ether	diflufenican	----
13	DOXP SYNTHASE INHIBITOR (1-DEOXY-D-XYULOSE 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>
				bicyclopyrone	<i>Optogen</i>
			Triketone	mesotrione	<i>Callisto</i>
				tembotrione	<i>Laudis</i>

CELL MEMBRANE DISRUPTERS					
14	PPO INHIBITORS	6	Diphenyl ether	acifluorfen <i>Ultra Blazer</i> fomesafen <i>Flexstar, Reflex, others</i> lactofen <i>Cobra, Phoenix</i>	
			N-Phenyl imide	flumiclorac <i>Resource</i> flumioxazin <i>Valor, Chateau, others</i> fluthiacet <i>Cadet</i> safinacil <i>Sharpen</i> tiafenacil <i>Reviton, Gamma</i>	
				N-Phenyl triazolinone	carfentrazone <i>Aim</i> sulfentrazone <i>Spartan</i>
				6	Pyridinium

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

SEEDLING SHOOT GROWTH INHIBITORS				
			8	Benzofuran <i>ethofumesate</i>
				acetochlor <i>Norton</i>
				acetochlor <i>Harness, Surpass, Warrant, others</i>
				dimethenamid-P <i>Outlook</i>
				s-metolachlor <i>Dual Magnum, others</i>
				isoxazoline <i>Zidua</i>
				pyrasulfotole <i>Alite 27, Balance Flexx</i>
				topramezone <i>Armezon, Impact</i>
				tolpyralate <i>Shieldex</i>
				bicyclopyrone <i>Optogen</i>
				mesotrione <i>Callisto</i>
				tembotrione <i>Laudis</i>
				isoxaflutole <i>Alite 27, Balance Flexx</i>
				pyrasulfotole <i>Alite 27, Balance Flexx</i>
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