

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)

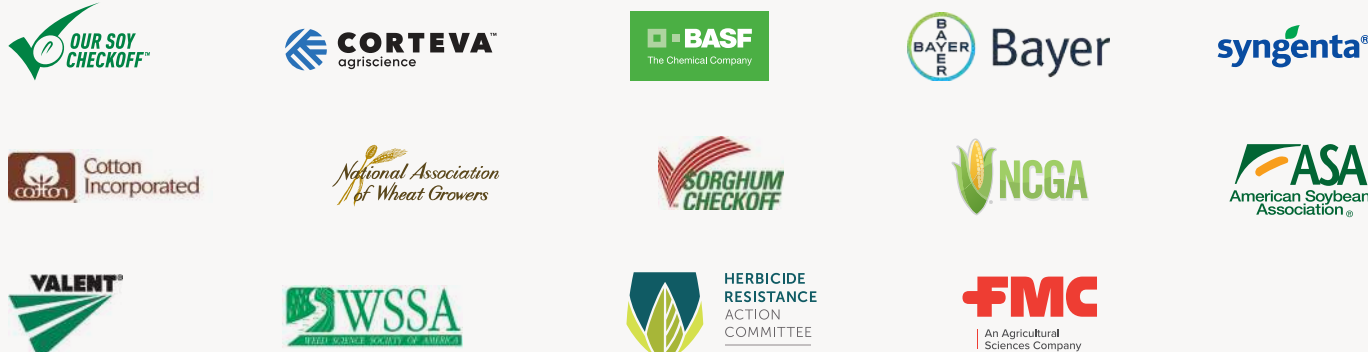
This chart groups herbicides by their modes of action to assist you in selecting herbicides 1) to maintain greater diversity in herbicide use and 2) to rotate among effective herbicides with different sites of action to delay the development of herbicide resistance.

SITE-OF-ACTION GROUP ¹	NUMBER OF RESISTANT WEED SPECIES IN U.S.												
	SITE OF ACTION	CHEMICAL FAMILY	ACTIVE INGREDIENT										
LIPID SYNTHESIS INHIBITORS													
1	ACCASE INHIBITORS (acetyl CoA carboxylase)	Aryloxyphenoxypropionate (fops)	clodinafop <i>Discover HG</i>										
			cymalofop <i>Clincher</i>										
			fenoxaprop <i>Ricestar HT, others</i>										
			fluzafop <i>Fusilade DX</i>										
			quizalofop <i>Agressor, Assure II, Targa</i>										
			sethoxydim <i>Select Max, others</i>										
		Cyclohexanedione (difs)	poast <i>Poast Plus</i>										
			phenylglyoxaline	pinoxaden <i>Axial XL</i>									
		AMINO ACID SYNTHESIS INHIBITORS											
		2	ALS INHIBITORS (acetolactate synthase)	Imidazolinone	imazamox <i>Raptor, Beyond</i>								
					imazaicp <i>Plateau</i>								
					imazaapy <i>Arsenal</i>								
					imazaquin <i>Scepter</i>								
imazethapyr <i>Pursuit, Newpath</i>													
florasulfuron													
mesosulfuron													
trifluralin													
trifluzoxime													
trifluroxypyridin													
trifluroxysulfuron													
trifluralin													
Pyrimidinyl benzoates	bispyribac <i>Regiment</i>												
	pyrithiobac <i>Staple</i>												
	bensulfuron <i>Londax</i>												
	chlorsulfuron <i>Classic</i>												
	chlorsulfuron <i>Glean</i>												
	halosulfuron <i>Permit, Sandea</i>												
	iodosulfuron <i>Autumn</i>												
	mesosulfuron <i>Osprey</i>												
	metsulfuron <i>Ally</i>												
	nicosulfuron <i>Accent Q, Zest</i>												
	orthosulfamuron <i>Strada</i>												
	primisulfuron <i>Beacon</i>												
	prosofluron <i>Peak</i>												
	rimsulfuron <i>Matrix, Resolve</i>												
	sulfosulfuron <i>Outrider</i>												
	thifensulfuron <i>Harmony</i>												
	triasulfuron <i>Amber</i>												
	tribenuron <i>Express</i>												
trifloxysulfuron <i>Envok</i>													
trifluralin <i>UpBeet</i>													
flucarbazone <i>Everest, Pre-Pare</i>													
proprylcarbazone <i>Olympus</i>													
thiencarbazone <i>Varro</i>													
Triazolinones	clorasulfuron <i>FirstRate</i>												
	florasulfuron <i>component of Orion, Quelex, Starane Flex</i>												
	flumetsulam <i>Python</i>												
Triazolopyrimidine - Type 1	florasulam												
	penoxsulam <i>Grasp</i>												
Triazolopyrimidine - Type 2	pyrasulfuron <i>PowerFlex HL</i>												
9	EPSP SYNTHASE INHIBITOR (5-enolpyruvyl-shikimate-3-phosphate)			Glycine	glyphosate <i>Roundup, several others</i>								
				GROWTH REGULATORS									
				4	SYNTHETIC AUXINS (TIR1, AFB1-5 and unknown auxin receptor)	Benzoate	dicamba <i>Banvel, Clarity, DIFlex, Engenia, XtendiMax, others</i>						
							2,4-D <i>2,4-D, Enlist One, others</i>						
						Phenoxy carboxylate	MCPA <i>MCPA, others</i>						
							aminopyralid <i>Milestone</i>						
						Pyridine carboxylate	clopyralid <i>Stinger HL</i>						
							halaxiflufen <i>Elevore</i>						
							fluroxypyr <i>Starane Ultra</i>						
						Pyridoxy carboxylate	triclopyr <i>Garlon, Remedy Ultra</i>						
							quinclorac <i>Facet</i>						
						19	AUXIN TRANSPORT INHIBITOR	Aryl carboxylate	diflufenzopyr <i>component of Status</i>				
						PHOTOSYNTHESIS INHIBITORS							
						5	PHOTOSYSTEM II INHIBITORS (D1 Serine 264 binders and non-histidine 215 binders)	Amide	propanil <i>SuperWham</i>				
									atrazine <i>AAtrex, others</i>				
									prometon <i>Pramitol</i>				
									prometryn <i>Caparol</i>				
simazine <i>Propral</i>													
Triazine	hexazinone <i>Velpar</i>												
	metribuzin <i>Metribuzin, others</i>												
	terbacil <i>Sinbar</i>												
	diuron <i>Direx, Karmex</i>												
	fluometuron <i>Cotoran</i>												
Uracil	linuron <i>Lorax, Linex</i>												
	tebuthiuron <i>Spike</i>												
	benzathiazidinone <i>Basagran, others</i>												
	nitroline <i>Maestro, Moxey, others</i>												
6	PHOTOSYSTEM II INHIBITORS (D1 Histidine 215 binders)			Phenyl pyridazine	pyridate <i>Tough</i>								
10	GLUTAMINE SYNTHETASE INHIBITORS			Phosphinic acid	glufosinate <i>Liberty, Rely, Novesta, others</i>								
				PIGMENT INHIBITORS									
				12	PHYTOENE DESATURASE (PDS) INHIBITORS			Diphenyl heterocycle	fluridone <i>Brake, Sonar</i>				
								N-Phenyl heterocycle	norfurazon <i>Solicam</i>				
								Phenyl ether	diflufenican				
								13	DOXP SYNTHASE INHIBITOR (1-DEOXY-D-XYLULOSE 5-PHOSPHATE)	Isoxazolidinone	clomazone <i>Command 3ME</i>		
											27	HPPD INHIBITORS	Isoxazole
								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>												
2				tembotrione <i>Laudis</i>									
CELL MEMBRANE DISRUPTERS													
14	PPO INHIBITORS			Diphenyl ether	acifluorfen <i>Ultra Blazer</i>								
					fomesafen <i>Flexstar, Reflex, others</i>								
					lactofen <i>Cobra, Phoenix</i>								
					flumiclorac <i>Resource</i>								
				N-Phenyl imide	flumioxazin <i>Valor, Chateau, others</i>								
					sulfenacil <i>Sharpen</i>								
					tiafenacil <i>Reviton, Gamma</i>								
					carfentrazone <i>Aim</i>								
				N-Phenyl triazolone	sulfentrazone <i>Spartan</i>								
					diquat <i>Reglone</i>								
					paraquat <i>Gramoxone SL</i>								
					22			PHOTOSYSTEM I ELECTRON DIVERTER	Pyridinium	paraquat			
										SEEDLING ROOT GROWTH INHIBITORS			
										3	MICROTUBULE ASSEMBLY INHIBITORS	Benzamide	pronamide <i>Kerb</i>
													ethalfuralin <i>Sonalan</i>
		pendimethalin <i>Prowl H2O, others</i>											
		Dinitroaniline	trifluralin <i>Treflan, others</i>										
			Pyridine		diithiopyr <i>Dimension</i>								
		SEEDLING SHOOT GROWTH INHIBITORS											
		15	VERY LONG-CHAIN FATTY ACID SYNTHESIS INHIBITORS	Benzofuran	ethofumesate <i>Nortron</i>								
					acetochlor <i>Harness, Surpass, Warrant, others</i>								
					α-Chloroacetamide			dimethenamid-P <i>Outlook</i>					
								s-metolachlor <i>Dual II Magnum, others</i>					
						isoxazoline <i>Zidua</i>							
					α-Oxacetamide	flufenacet <i>Define</i>							
						cycloate <i>Ro-Neet</i>							
					Thiocarbamate	EPTC <i>Eradicane, Eptam</i>							
						thiobencarb <i>Boloro</i>							
triallate <i>Far-Go</i>													
Aykyiazine <i>Esplanade, Rezilon</i>													
Benzamide <i>Gallery, Trellis</i>													
0	UNKNOWN			Amide	nagropamide <i>Devrinc</i>								
Arsenic	MSMA <i>MSMA</i>												

¹Site-of-action group numbers follow the revised 2019 Herbicide Resistance Action Committee (HRAC) classification.

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

TAKE ACTION IS ENDORSED BY THE FOLLOWING ORGANIZATIONS:



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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		SITE-OF-ACTION GROUP
	ACTIVE INGREDIENT	TRADE NAME	
ACURON	bicyclopyrone	<i>Optogen</i>	27
	mesotrione	<i>Callisto</i>	27
	atrazine	<i>AAtrex</i>	5
	s-metolachlor	<i>Dual II Magnum</i>	15
	bicyclopyrone	<i>Optogen</i>	27
	mesotrione	<i>Callisto</i>	27
ACURON FLEXI	s-metolachlor	<i>Dual II Magnum</i>	15
	bicyclopyrone	<i>Optogen</i>	27
	mesotrione	<i>Callisto</i>	27
ACURON GT	thifensulfuron	<i>Harmony</i>	2
	glyphosate	<i>glyphosate</i>	9
	tribenuron	<i>Express</i>	2
AFFINITY BROADSPEC (Affinity Tank-Mix)	tribenuron	<i>Express</i>	2
	thifensulfuron	<i>Harmony</i>	2
	tribenuron	<i>Express</i>	2
	flumioxazin	<i>Valor</i>	14
AFFORIA	dicamba	<i>Clarity</i>	4
	thifensulfuron	<i>Harmony</i>	2
	tribenuron	<i>Express</i>	2
	metsulfuron	<i>Ally</i>	2
	thifensulfuron	<i>Harmony</i>	2
AGILITY SG	thifensulfuron	<i>Harmony</i>	2
	tribenuron	<i>Express</i>	2
	metsulfuron	<i>Ally</i>	2
	pyrasulfuron	<i>Zidua</i>	15
	carfentrazone	<i>Aim</i>	14
ANTHEM FLEX	pyrasulfuron	<i>Zidua</i>	15
	fluthiacet	<i>Cadet</i>	14
ANTHEM MAXX	pyrasulfuron	<i>Zidua</i>	15
	fluthiacet	<i>Cadet</i>	14
ARMEZON PRO	topramezone	<i>Armezon</i>	27
	dimethenamid-P	<i>Outlook</i>	15
AUTHORITY ASSIST	sulfentrazone	<i>Spartan</i>	14
	imazethapyr	<i>Pursuit</i>	2
AUTHORITY EDGE	sulfentrazone	<i>Spartan</i>	14
	pyrasulfuron	<i>Zidua</i>	15
AUTHORITY ELITE	sulfentrazone	<i>Spartan</i>	14
	s-metolachlor	<i>Dual II Magnum</i>	15
AUTHORITY FIRST	sulfentrazone	<i>Spartan</i>	14
	clorasulfuron	<i>FirstRate</i>	2
AUTHORITY MTZ (Preview 2.1)	sulfentrazone	<i>Spartan</i>	14
	metribuzin	<i>Metribuzin</i>	5
AUTHORITY SUPREME	sulfentrazone	<i>Spartan</i>	14
	pyrasulfuron	<i>Zidua</i>	15
AUTHORITY XL (Authority Maxx)	sulfentrazone	<i>Spartan</i>	14
	chlorimuron	<i>Classic</i>	2
AUTUMN SUPER	iodosulfuron	<i>Autumn</i>	2
	thiencarbazone	<i>Varro</i>	2
	pinoxaden	<i>Axial XL</i>	1
AXIAL BOLD	fenoxaprop	<i>Ricestar</i>	1
	pinoxaden	<i>Axial XL</i>	1
AXIAL STAR	fluroxypyr	<i>Starane</i>	4
	rimsulfuron	<i>Resolve</i>	2
BASIS BLEND	thifensulfuron	<i>Harmony</i>	2
	s-metolachlor	<i>Dual II Magnum</i>	15
BICEP II MAGNUM (Bicep Lite II Magnum)	atrazine	<i>AAtrex</i>	5
	s-metolachlor	<i>Dual II Magnum</i>	15
BOUNDARY	s-metolachlor	<i>Dual II Magnum</i>	15
	metribuzin	<i>Metribuzin</i>	5
BROADAXE XC	s-metolachlor	<i>Dual II Magnum</i>	15
	sulfentrazone	<i>Spartan 4F</i>	14
BRONATE ADVANCED	bromoxynil	<i>Maestro</i>	6
	MCPA	<i>MCPA</i>	4
CALIBRA	s-metolachlor	<i>Dual II Magnum</i>	15
	mesotrione	<i>Callisto</i>	27
CALLISTO GT	mesotrione	<i>Callisto</i>	27
	glyphosate	<i>glyphosate</i>	9
CALLISTO XTRA	mesotrione	<i>Callisto</i>	27
	atrazine	<i>AAtrex</i>	5
CANOPY	chlorimuron	<i>Classic</i>	2
	metribuzin	<i>Metribuzin</i>	5
CANOPY EX	chlorimuron	<i>Classic</i>	2
	tribenuron	<i>Express</i>	2
CAPRENO	thiencarbazone	<i>Varro</i>	2
	tembotrione	<i>Laudis</i>	2
	MCPA	<i>MCPA</i>	4
CARNIVORE	clopyralid	<i>Stinger</i>	4
	bromoxynil	<i>Maestro</i>	6
CHEETAH MAX	glufosinate	<i>Liberty</i>	10
	fomesafen	<i>Reflex</i>	14
CINCH ATZ (Cinch ATZ Lite)	s-metolachlor	<i>Dual II Magnum</i>	15
	atrazine	<i>AAtrex</i>	5
CLEARPATH	quinclorac	<i>Facet</i>	4
	imazethapyr	<i>Newpath</i>	2
COLT AS	clopyralid	<i>Stinger</i>	4
	fluroxypyr	<i>Starane</i>	4
COLT + SALVO	2,4-D	<i>2,4-D</i>	4
	fluroxypyr	<i>Starane</i>	4
COLT + SWORD	MCPA	<i>MCPA</i>	4
	fluroxypyr	<i>Starane</i>	4
CORVUS	thiencarbazone	<i>Varro</i>	2
	isoxaflutole	<i>Balance Flexx</i>	27
COYOTE	s-metolachlor	<i>Dual II Magnum</i>	15
	mesotrione	<i>Callisto</i>	27
CRUSHER	rimsulfuron	<i>Resolve</i>	2
	thifensulfuron	<i>Harmony</i>	2
CURTAIL	clopyralid	<i>Stinger</i>	4
	2,4-D	<i>2,4-D</i>	4
CURTAIL M	clopyralid	<i>Stinger</i>	4
	MCPA	<i>MCPA</i>	4
DEGREE XTRA	acetochlor	<i>Degree</i>	15
	atrazine	<i>AAtrex</i>	5
DIFLEX DUO	dicamba	<i>DIFlex</i>	4
	tembotrione	<i>Laudis</i>	27
DIMETRIC CHARGED	metribuzin	<i>Metribuzin</i>	5
	flumioxazin	<i>Valor</i>	14
ENLIST DUO	2,4-D	<i>2,4-D</i>	4
	glyphosate	<i>glyphosate</i>	9
ENLITE	chlorimuron	<i>Classic</i>	2
	thifensulfuron	<i>Harmony</i>	2
ENVIVE	flumioxazin	<i>Valor</i>	14
	imazethapyr	<i>Pursuit</i>	2
EXTREME	glyphosate	<i>glyphosate</i>	9
	flumioxazin	<i>Valor</i>	14
FIERCE EZ	pyrasulfuron	<i>Zidua</i>	15
	flumioxazin	<i>Valor</i>	14
FIERCE MTZ	pyrasulfuron	<i>Zidua</i>	15
	metribuzin	<i>Metribuzin</i>	5
	flumioxazin	<i>Valor</i>	14
FIERCE XLT	pyrasulfuron	<i>Zidua</i>	15
	chlorimuron	<i>Classic</i>	2
FINESSE	chlorsulfuron	<i>Glean</i>	2
	metsulfuron	<i>Ally</i>	2
FIRSTSHOT	thifensulfuron	<i>Harmony</i>	2
	tribenuron	<i>Express</i>	2
FLEXSTAR GT	fomesafen	<i>Flexstar</i>	14
	glyphosate	<i>glyphosate</i>	9
FULLTIME NXT	acetochlor	<i>TopNotch</i>	15
	atrazine	<i>AAtrex</i>	5
	fluzafop	<i>Fusilade DX</i>	1
FUSION	fenoxaprop	<i>Puma</i>	1
	pyrasulfuron	<i>PowerFlex HL</i>	2
GOLDSKY	florasulam	----	2
	fluroxypyr	<i>Starane</i>	4
	aminopyralid	<i>Milestone</i>	4
GRAZZONNEXT HL	2,4-D	<i>2,4-D</i>	4
	s-metolachlor	<i>Dual II Magnum</i>	15
HALEX GT	mesotrione	<i>Callisto</i>	27
	glyphosate	<i>glyphosate</i>	9
HARMONY EXTRA	thifensulfuron	<i>Harmony</i>	2
	tribenuron	<i>Express</i>	2
HARNESS MAX	acetochlor	<i>Harness</i>	15
	mesotrione	<i>Callisto</i>	27
HARNESS XTRA	acetochlor	<i>Harness</i>	15
	atrazine	<i>AAtrex</i>	5
HORNET	clopyralid	<i>Stinger</i>	4
	flumetsulam	<i>Python</i>	2
HUSKIE	pyrasulfuron	----	27
	bromoxynil	<i>Maestro</i>	6
HUSKIE COMPLETE	pyrasulfuron	----	27
	bromoxynil	<i>Maestro</i>	6
HUSKIE FX	thiencarbazone	<i>Varro</i>	2
	pyrasulfuron	----	27
IMPACT CORE	bromoxynil	<i>Maestro</i>	6
	dicamba	<i>Banvel</i>	4
IMPACTZ	halosulfuron	<i>Pursuit</i>	2
	imazethapyr	<i>Pursuit</i>	2
INTERMOC	glufosinate	<i>Liberty</i>	10
	s-metolachlor	<i>Dual II Magnum</i>	15
KATAGON	nicosulfuron	<i>Accent Q</i>	2
	tolpyralate	<i>Shieldex</i>	27
KEYSTONE NXT (Keystone LA NXT)	acetochlor	<i>Surpass NXT</i>	15
	atrazine	<i>AAtrex</i>	5
KOCHIADORE	2,4-D	<i>2,4-D, others</i>	4
	fluroxypyr	<i>Starane</i>	4
	bromoxynil	<i>Maestro</i>	6
KYBER	flumioxazin		