

# 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)

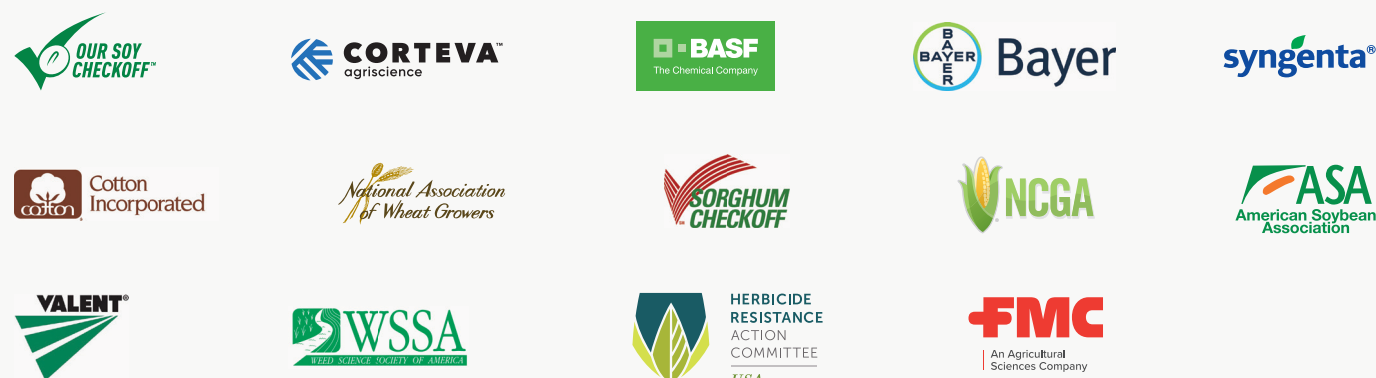
This chart groups herbicides by their modes of action to assist you in selecting herbicides 1) to maintain greater diversity in herbicide use and 2) to rotate among effective herbicides with different sites of action to delay the development of herbicide resistance.

SITE-OF-ACTION GROUP <sup>1</sup>	SITE OF ACTION	NUMBER OF RESISTANT WEED SPECIES IN U.S.								
		CHEMICAL FAMILY	ACTIVE INGREDIENT	PRODUCT EXAMPLES (TRADE NAME)						
<b>LIPID SYNTHESIS INHIBITORS</b>										
1	ACCase INHIBITORS (acetyl CoA carboxylase)	14	Aryloxyphenoxypropionate (fops)	clodinafop <i>Discover NG</i> cyhalofop <i>Clincher</i> fenoxaprop <i>Ricestar HT, others</i> flazifop <i>Fusilade DX</i> quizalofop <i>Aggressor, Assure II, Targa</i> clethodim <i>Select Max, others</i> sethoxydim <i>Poast, Poast Plus</i> Phenylpyrazoline pinoxaden <i>Axial XL</i>						
			<b>AMINO ACID SYNTHESIS INHIBITORS</b>							
			2	ALS INHIBITORS (acetolactate synthase)	53	Imidazolinone	imazamox <i>Raptor, Beyond, Clearmax</i> imazapic <i>Plateau</i> imazapyr <i>Arsenal</i> imazaquin <i>Scepter</i> imazethapyr <i>Pursuit, Newpath</i> bispyribac <i>Regiment</i> pyrithiobac <i>Staple</i> bensulfuron <i>Landax</i> chlorimuron <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> halosulfuron <i>Strada</i> primisulfuron <i>Beacon</i> prosulfuron <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>Envoke</i> triflusaluron <i>UpBeet</i> flucarbazone <i>Everest, Pre-Para, Sierra</i> propoxycarbazone <i>Olympus</i> thiencarbazone <i>Varro</i> cloransulam <i>FirstRate</i>			
						9	EPSP SYNTHASE INHIBITOR (5-enolpyruvyl-shikimate-3-phosphate)	17	Glycine	glyphosate <i>Roundup, several others</i>
									<b>GROWTH REGULATORS</b>	
4	SYNTHETIC AUXINS (TIR1, AFB5 and unknown auxin receptor)	10							Benzoic acid	dicamba <i>Banvel, Clarity, DiFlexx, Engenia, XtendiMax, others</i>
						Phenoxy	2,4-D <i>2,4-D, Enlist One, others</i> MCPA <i>MCPA, others</i> aminopyralid <i>Milestone</i> clopyralid <i>Stinger HL</i> florpyrauxifen <i>Loyant</i> fluroxypyr <i>Starane Ultra</i> halauxifen <i>Elevore</i> triclopyr <i>Garlon, Remedy Ultra</i> Quinoline carboxylate quinclorac <i>Facet</i>			
						19	AUXIN TRANSPORT INHIBITOR	0	Aryl carboxylate	diflufenzopyr <i>component of Status</i>
									<b>PHOTOSYNTHESIS INHIBITORS</b>	
5	PHOTOSYSTEM II INHIBITORS (Serine 264 binders)	28				Amide	propanil <i>SuperWham</i>			
						Phenylcarbamate	desmedipham <i>Betenex</i> phenmedipham <i>component of Betamix</i> atrazine <i>AAtrex, others</i> prometon <i>Pramitol</i> prometryn <i>Caparol</i> simazine <i>Princap</i>			
						Triazine	hexazinone <i>Velpar</i> metribuzin <i>Metribuzin, others</i> terbacil <i>Sinbar</i>			
						Uracil	diuron <i>Dirax, Karmex</i> fluometuron <i>Cotoran</i> linuron <i>Lorox, Linex</i> tebuthiuron <i>Spike</i>			
						Urea	benfendizone <i>Basagran, others</i> nitrilic <i>Maestro, Moxy, others</i> Phenyl pyridazine pyridate <i>Tough</i>			
						6	PHOTOSYSTEM II INHIBITORS (Histidine 215 binders)	1	Benzothiadiazinone	benfendizone <i>Basagran, others</i>
									Nitrilic	bromoxynil <i>Maestro, Moxy, others</i>
						10	GLUTAMINE SYNTHETASE INHIBITOR	1	Phosphinic acid	glufosinate <i>Liberty, Reley, Noventa, others</i>
			<b>PIGMENT INHIBITORS</b>							
			12	PHYTOENE DESATURASE (PDS) INHIBITOR	1	Diphenyl heterocycle	fluridone <i>Sonar</i>			
N-Phenyl heterocycle	norflurazon <i>Solicam</i>									
13	DOXP SYNTHASE INHIBITOR (1-DEOXY-D-XYLULOSE 5-PHOSPHATE)	2	Isoxazolidinone	clomazone <i>Command 3ME</i>						
			27	HPPD INHIBITORS	2	Isoxazole	isoxaflutole <i>Alite 27, Balance Flexx</i> pyrasulfotole <i>component of Huskie</i> topramezone <i>Armezon, Impact</i> tolpyralate <i>Shieldex</i> mesotrione <i>Callisto</i> triketone tembotrione <i>Laudis</i> bicyclopyrone <i>component of Acuron</i>			
<b>CELL MEMBRANE DISRUPTERS</b>										
14	PPO INHIBITORS	4	Diphenylether	acifluorfen <i>Ultra Blazer</i> fomesafen <i>Flexstar, Reflex, others</i> lactofen <i>Cobra, Phoenix</i> flumiclorac <i>Resource</i> N-Phenyl imide saflufenacil <i>Sharpen</i> tiafenacil <i>Reviton, Gamma</i> N-Phenyl triazolone carfentrazone <i>Aim</i> sulfentrazone <i>Spartan</i>						
			22	PHOTOSYSTEM I ELECTRON DIVERTER	6	Pyridinium	diquat <i>Reglone</i> paraquat <i>Gramoxone SL</i>			
						<b>SEEDLING ROOT GROWTH INHIBITORS</b>				
			3	MICROTUBULE ASSEMBLY INHIBITORS	6	Benzamide	pronamide <i>Kerb</i> ethalfuralin <i>Sonlan</i>			
Dinitroaniline	pendimethalin <i>Prowl H2O, others</i> trifluralin <i>Treflan, others</i>									
Pyridine	dithiopyr <i>Dimension</i>									
<b>SEEDLING SHOOT GROWTH INHIBITORS</b>										
15	VERY LONG-CHAIN FATTY ACID SYNTHESIS INHIBITORS	8				Benzofuran	ethofumesate <i>Nortron</i>			
						Chloroacetamide	acetochlor <i>Harness, Surpass, Warrant, others</i> dimethenamid-P <i>Outlook</i> s-metolachlor <i>Dual Magnum, others</i>			
			Isoxazoline	pyroxasulfone <i>Zidua</i>						
			α-Oxacetamide	flufenacet <i>Define</i> butylate <i>Sutan +</i> cycloate <i>Ro-Neet</i> Thiocarbamate EPTC <i>Eradicane, Eptam</i> thiobencarb <i>Bolero</i> triallate <i>Far-Go</i> indaziflam <i>Esplanade, Rezilon</i> isoxaben <i>Gallery, Trellis</i>						
			29	CELLULOSE BIOSYNTHESIS INHIBITOR	0	Aryliquinoline	isoxaben <i>Gallery, Trellis</i>			
						Benzamide	isoxaben <i>Gallery, Trellis</i>			
			0	UNKNOWN	0	Amide	napropamide <i>Devrinol</i>			
						Arsenical	MSMA <i>MSMA</i>			

<sup>1</sup>Site-of-action group numbers follow the revised 2020 Herbicide Resistance Action Committee (HRAC) classification.

For more information and links to additional resources, visit [IWillTakeAction.com](http://IWillTakeAction.com)

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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	ACTIVE INGREDIENT	TRADE NAME	SITE-OF-ACTION GROUP	
			COMPONENT	GROUP
ACURON	bicyclopyrone	-----	27	
	mesotrione	Callisto	27	
	atrazine	AAtrex	5	2
ACURON FLEXI	bicyclopyrone	-----	27	
	s-metolachlor	Dual II Magnum	15	
	bicyclopyrone	-----	27	
ACURON GT	mesotrione	Callisto	27	
	s-metolachlor	Dual II Magnum	15	
	glyphosate	glyphosate	9	
AFFINITY BROADSPEC (Affinity TankMix)	thifensulfuron	Harmony	2	
	tribenuron	Express	2	
	thifensulfuron	Harmony	2	
AFFORIA	tribenuron	Express	2	
	flumioxazin	Valor	14	
	dicamba	Clarity	4	
AGILITY SG	thifensulfuron	Harmony	2	
	tribenuron	Express	2	
	metsulfuron	Ally	2	
ALLY EXTRA	thifensulfuron	Harmony	2	
	tribenuron	Express	2	
	metsulfuron	Ally	2	
ANTHEM FLEX	pyroxasulfone	Zidua	15	
	carfentrazone	Aim	14	
	pyroxasulfone	Zidua	15	
ANTHEM MAXX	fluthiacet	Cadet	14	
	fluthiacet	Cadet	14	
	topramezone	Armezon	27	
ARMEZON PRO	dimethenamid-P	Outlook	15	
	sulfentrazone	Spartan	14	
	imazethapyr	Pursuit	2	
AUTHORITY ASSIST	sulfentrazone	Spartan	14	
	pyroxasulfone	Zidua	15	
	fluthiacet	Cadet	14	
AUTHORITY EDGE	sulfentrazone	Spartan	14	
	pyroxasulfone	Zidua	15	
	sulfentrazone	Spartan	14	
AUTHORITY ELITE	sulfentrazone	Spartan	14	
	s-metolachlor	Dual Magnum	15	
	sulfentrazone	Spartan	14	
AUTHORITY FIRST	cloransulam	FirstRate	2	
	sulfentrazone	Spartan	14	
	metribuzin	Metribuzin	5	
AUTHORITY MTZ	sulfentrazone	Spartan	14	
	metribuzin	Metribuzin	5	
	sulfentrazone	Spartan	14	
AUTHORITY SUPREME	sulfentrazone	Spartan	14	
	pyroxasulfone	Zidua	15	
	sulfentrazone	Spartan	14	
AUTHORITY XL (Authority Maxx)	chlorimuron	Classic	2	
	iodosulfuron	Autumn	2	
	thiencarbazone	Varro	2	
AUTUMN SUPER	pinoxaden	Axial XL	1	
	fenoxaprop	Ricestar	1	
	pinoxaden	Axial XL	1	
AXIAL BOLD	fluroxypyr	Starane	4	
	rimsulfuron	Resolve	2	
	thifensulfuron	Harmony	2	
AXIAL STAR	desmedipham	Betenex	5	
	phenmedipham	-----	5	
	phenmedipham	-----	5	
BICEP II MAGNUM (Bicep Lite II Magnum)	s-metolachlor	Dual II Magnum	15	
	atrazine	AAtrex	5	
	s-metolachlor	Dual Magnum	15	
BOUNDARY	metribuzin	Metribuzin	5	
	fomesafen	Flexstar	14	
	fluridone	Sonar	12	
BRAKE F16	fluometuron	Cotoran	5	
	fluridone	Sonar	12	
	s-metolachlor	Dual Magnum	15	
BRAKE FX	sulfentrazone	Spartan 4F	14	
	bromoxynil	Maestro	6	
	MCPA	MCPA	4	
BROADAXE XC	mesotrione	Callisto	27	
	glyphosate	glyphosate	9	
	mesotrione	Callisto	27	
BRONATE	atrazine	AAtrex	5	
	MCPA	MCPA	4	
	atrazine	AAtrex	5	
CALLISTO GT	glyphosate	glyphosate	9	
	mesotrione	Callisto	27	
	atrazine	AAtrex	5	
CALLISTO XTRA	chlorimuron	Classic	2	
	metribuzin	Metribuzin	5	
	chlorimuron	Classic	2	
CANOPY	tribenuron	Express	2	
	thiencarbazone	Varro	2	
	tembotrione	Laudis	27	
CANOPY EX	MCPA	MCPA	4	
	clopyralid	Stinger	4	
	bromoxynil	Maestro	6	
CAPRENO	glufosinate	Liberty	10	
	fomesafen	Reflex	14	
	s-metolachlor	Dual II Magnum	15	
CARNIVORE	atrazine	AAtrex	5	
	atrazine	AAtrex	5	
	atrazine	AAtrex	5	
CINCH ATZ (Cinch ATZ Lite)	quinclorac	Facet	4	
	imazethapyr	Newpath	2	
	2,4-D	2,4-D	4	
CLEARPATH	fluroxypyr	Starane	4	
	MCPA	MCPA	4	
	fluroxypyr	Starane	4	
COLT + SALVO (Trump Card)	thiencarbazone	Varro	2	
	isoxaflutole	Balance Flexx	27	
	s-metolachlor	Dual II Magnum	15	
COLT + SWORD	MCPA	MCPA	4	
	fluroxypyr	Starane	4	
	thiencarbazone	Varro	2	
CORVUS	isoxaflutole	Balance Flexx	27	
	mesotrione	Callisto	27	
	mesotrione	Callisto	27	
COYOTE	rimsulfuron	Resolve	2	
	thifensulfuron	Harmony	2	
	clopyralid	Stinger	4	
CRUSHER	2,4-D	2,4-D	4	
	clopyralid	Stinger	4	
	MCPA	MCPA	4	
CURTAIL	acetochlor	Degree	15	
	atrazine	AAtrex	5	
	dicamba	DiFlexx	4	
CURTAIL M	tembotrione	Laudis	27	
	metribuzin	Metribuzin	5	
	metribuzin	Metribuzin	5	
DEGREE XTRA	dicamba	DiFlexx	4	
	tembotrione	Laudis	27	
	metribuzin	Metribuzin	5	
DIFLEX DUO	flumioxazin	Valor	14	
	flumioxazin	Valor	14	
	2,4-D	2,4-D	4	
DIMETRIC CHARGED	glyphosate	glyphosate	9	
	chlorimuron	Classic	2	
	thifensulfuron	Harmony	2	
ENLIST DUO	flumioxazin	Valor	14	
	chlorimuron	Classic	2	
	flumioxazin	Valor	14	
ENLITE	chlorimuron	Classic	2	
	thifensulfuron	Harmony	2	
	flumioxazin	Valor	14	
ENLITE	chlorimuron	Classic	2	
	thifensulfuron	Harmony	2	
	flumioxazin	Valor	14	
ENVIVE	imazethapyr	Pursuit	2	
	glyphosate	glyphosate	9	
	flumioxazin	Valor	14	
EXTREME	pyroxasulfone	Zidua	15	
	flumioxazin	Valor	14	
	flumioxazin	Valor	14	
FIERCE EZ	pyroxasulfone	Zidua	15	
	flumioxazin	Valor	14	
	pyroxasulfone	Zidua	15	
FIERCE MTZ	metribuzin	Metribuzin	5	
	flumioxazin	Valor	14	
	pyroxasulfone	Zidua	15	
FIERCE XLT	pyroxasulfone	Zidua	15	
	chlorimuron	Classic	2	
	chlorsulfuron	Glean	2	
FINESSE	metsulfuron	Ally	2	
	thifensulfuron	Harmony	2	
	tribenuron	Express	2	
FIRSTSHOT	fomesafen	Flexstar	14	
	glyphosate	glyphosate	9	
	fenoxaprop	Tecoma	1	
FLEXSTAR GT	pinoxaden	Axial XL	1	
	acetochlor	TopNotch	15	
	atrazine	AAtrex	5	
FOXFIRE	fluzifop	Fusilade DX	1	
	fenoxaprop	Puma	1	
	pyroxasulfone	PowerFlex HL	2	
FULTIME NXT	florasulam	-----	2	
	fluroxypyr	Starane	4	
	atrazine	AAtrex	5	
FUSION	fluzifop	Fusilade DX	1	
	fenoxaprop	Puma	1	
	pyroxasulfone	PowerFlex HL	2	
GOLDSKY	florasulam	-----	2	
	fluroxypyr	Starane	4	
	s-metolachlor	Dual Magnum	15	
GRAMOXONE MAGNUM*	paraquat	Gramoxone	22	
	aminopyralid	Milestone	4	
	2,4-D	2,4-D	4	
GRAZONNEX HL	s-metolachlor	Dual Magnum	15	
	mesotrione	Callisto	27	
	glyphosate	glyphosate	9	
HALEX GT	thifensulfuron	Harmony	2	
	tribenuron	Express	2	
	acetochlor	Harness	1	