

# 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)

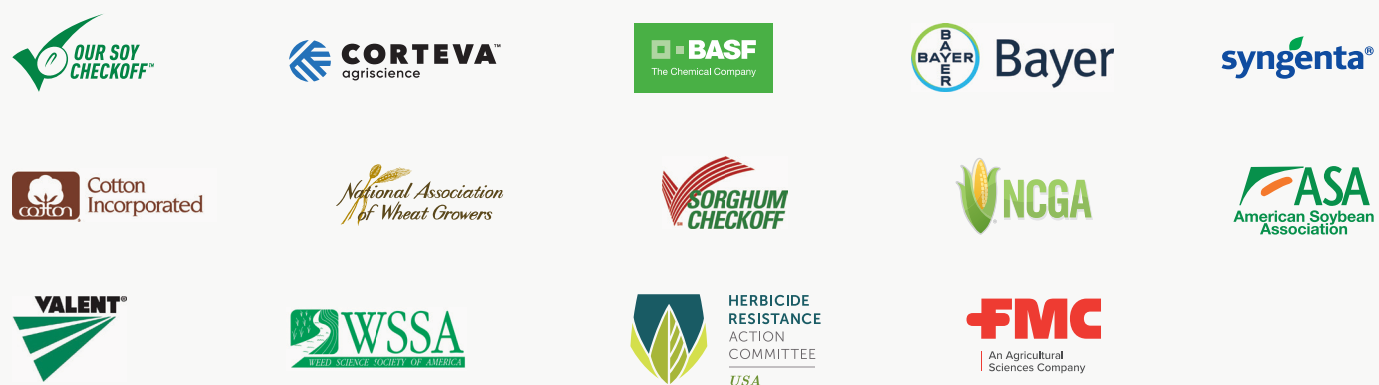
This chart groups herbicides by their modes of action to assist you in selecting herbicides 1) to maintain greater diversity in herbicide use and 2) to rotate among effective herbicides with different sites of action to delay the development of herbicide resistance.

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)	Aryloxyphenoxypropionate (fops)	clodinafop	<i>Discover NG</i>												
			cyhalofop	<i>Clincher</i>												
			fenoxaprop	<i>Ricestar HT, others</i>												
			fluzafop	<i>Fusilade DX</i>												
			quizalofop	<i>Aggressor, Assure II, Targa</i>												
		Cyclohexanedione (dims)	cetodifop	<i>Select Max, others</i>												
			sethoxydim	<i>Poast, Poast Plus</i>												
			Phenylglyoxaline	pinoxaden	<i>Axial XL</i>											
		<b>AMINO ACID SYNTHESIS INHIBITORS</b>														
		2	ALS INHIBITORS (acetolactate synthase)	Imidazolinone	imazamox	<i>Raptor, Beyond, Clearmax</i>										
imazaapic	<i>Plateau</i>															
imazaquin	<i>Arsenal</i>															
imazaquin	<i>Scepter</i>															
imazethapyr	<i>Pursuit, Newpath</i>															
Pyrimidinyl benzoates	bispyribac				<i>Regiment</i>											
	pyrithiobac				<i>Staple</i>											
	bensulfuron				<i>Londax</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>												
	Sulfonyleurea			orthosulfamuron	<i>Strada</i>											
				primisulfuron	<i>Beacon</i>											
				proflumuron	<i>Peak</i>											
rimsulfuron				<i>Matrx, Resolve</i>												
sulfosulfuron				<i>Maverick</i>												
thifensulfuron				<i>Harmony</i>												
triasulfuron				<i>Amber</i>												
tribenuron				<i>Express</i>												
trifloxysulfuron				<i>Envoke</i>												
triflusulfuron				<i>UpBeet</i>												
Triazolines				flucarbazone	<i>Everest, Pre-Para, Sierra</i>											
				propoxycarbazone	<i>Olympus</i>											
				thiencarbazone	<i>Varro</i>											
	cloransulam			<i>FirstRate</i>												
	Triazolopyrimidine - Type 1			florasulam	<i>component of Orion</i>											
flumetsulam				<i>Python, Accolade</i>												
Triazolopyrimidine - Type 2	penoxsulam			<i>Grasp</i>												
	pyroxasulam			<i>PowerFlex HL</i>												
9	EPSP SYNTHASE INHIBITOR (5-enolpyruvyl-shikimate-3-phosphate)			Glycine	glyphosate	<i>Roundup, several others</i>										
					<b>GROWTH REGULATORS</b>											
					4	SYNTHETIC AUXINS (TIR1, AFB5 and unknown auxin receptors)	Benzoic acid	dicamba	<i>Clarity, DIFlex, Engenia, FeXapan, XtendiMax, others</i>							
								2,4-D	<i>2,4-D, Enlist One, others</i>							
								MCPA	<i>MCPA, others</i>							
							Phenoxy	aminopyralid	<i>Milestone</i>							
								clopyralid	<i>Stinger</i>							
								florpyrauxifen	<i>Loyant</i>							
								fluroxypyr	<i>Starane Ultra</i>							
							Pyridine carboxylate	halaxifen	<i>Elevore</i>							
								quinclorac	<i>Facet</i>							
								triclopyr	<i>Garlon, Remedy Ultra</i>							
					19	AUXIN TRANSPORT INHIBITOR	Aryl carboxylate	diffenozopyr	<i>component of Status</i>							
								<b>PHOTOSYNTHESIS INHIBITORS</b>								
								5	PHOTOSYSTEM II INHIBITORS (Serine 264 binders)	Amide	propanil	<i>SuperWham</i>				
											Phenylcarbamate	desmedipham	<i>Betenex</i>			
												phenmedipham	<i>component of Betamix</i>			
atrazine	<i>AAtrex, others</i>															
Triazine	prometon	<i>Pramitol</i>														
	prometryn	<i>Caparol</i>														
	simazine	<i>Princep</i>														
Triazinone	hexazinone	<i>Veljar</i>														
	metribuzin	<i>Metribuzin, others</i>														
Uracil	terbacil	<i>Sinbar</i>														
	diuron	<i>Direx, Karmex</i>														
Urea	fluometuron	<i>Cotoran</i>														
	linuron	<i>Lorax, Linex</i>														
Benzothiadiazine	tebuthiuron	<i>Spike</i>														
	Nitrite	benzotazon	<i>Basagran, others</i>													
bromoxynil		<i>Maestro, Moxy, others</i>														
Phenyl pyridazine		pyridate	<i>Tough</i>													
6	PHOTOSYSTEM II INHIBITORS (Histidine 215 binders)	1	Benzothiadiazine	benzotazon	<i>Basagran, others</i>											
				NITROGEN METABOLISM INHIBITOR	10	GLUTAMINE SYNTHETASE INHIBITOR	1			Phosphinic acid	glufosinate	<i>Liberty, Rely, Scout, Noventa, others</i>				
											<b>PIGMENT INHIBITORS</b>					
											12	PHYTOENE DESATURASE (PDS) INHIBITOR	1	Diphenyl heterocycle	fluridone	<i>Sonar</i>
															N-Phenyl heterocycle	norflurazon
											13	DOXP SYNTHASE INHIBITOR (1-DEOXY-D-XYLULOSE 5-PHOSPHATE)	1	Isoxazolidinone	clomazone	<i>Command 3ME</i>
															27	HPPD INHIBITORS
											pyrasulfotole	<i>component of Huskie</i>				
											27	HPPD INHIBITORS	2	Pyrazole	topramezone	<i>Armezon, Impact</i>
															tolpyralate	<i>Shieldex</i>
mesotrione	<i>Callisto</i>															
tembotrione	<i>Laudis</i>															
27	HPPD INHIBITORS	2	Triketone	bicyclopyrone	<i>component of Acuron</i>											
				<b>CELL MEMBRANE DISRUPTERS</b>												
14	PPD 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	flumioxazin	<i>Valor, Chateau, others</i>												
			saflufenacil	<i>Sharpen</i>												
			tiafenacil	<i>Reviton, Gamma</i>												
			carfentrazone	<i>Aim</i>												
		N-Phenyl triazolone	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>					
										ethalfuratin	<i>Sonalan</i>					
pendimethalin	<i>Prowl H2, 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>Norton</i>											
				acetochlor	<i>Harness, Surpass, Warrant, others</i>											
				α-Chloroacetamide	dimethenamid-P	<i>Outlook</i>										
				s-metolachlor	<i>Dual Magnum, others</i>											
			Isoxazoline	pyroxasulfone	<i>Zidua</i>											
				flufenacet	<i>Define</i>											
			α-Dyacetamide	butylate	<i>Sutan +</i>											
				cycloate	<i>Ro-Neet</i>											
Thiocarbamate	EPTC	<i>Eradicane, Eptam</i>														
	thiobencarb	<i>Bolero</i>														
21	CELLULOSE BIOSYNTHESIS INHIBITOR	0	Benzamide	isoxaben	<i>Gallery, Trellis</i>											
				<b>UNDEFINED</b>												
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 [www.IWillTakeAction.com](http://www.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			
				PREMIX	ACTIVE INGREDIENT	TRADE NAME	
ACURON	bicyclopyrone	-----	27	HUSKIE COMPLETE	pyrasulfotole	-----	27
	mesotrione	<i>Callisto</i>	27		bromoxynil	<i>Maestro</i>	6
	atrazine	<i>AAtrex</i>	5		thiencarbazone	<i>Varro</i>	2
	s-metolachlor	<i>Dual II Magnum</i>	15		acetochlor	<i>Harness</i>	15
	-----	-----	-----		topramezone	<i>Impact</i>	27
ACURON FLEXI	bicyclopyrone	-----	27	IMPACTZ	atrazine	<i>AAtrex</i>	27
	mesotrione	<i>Callisto</i>	27		topramezone	<i>Impact</i>	5
AFFINITY BROADSPEC (Affinity TankMix)	thifensulfuron	<i>Harmony</i>	2	INTERMOC	glufosinate	<i>Liberty</i>	10
	tribenuron	<i>Express</i>	2		s-metolachlor	<i>Dual Magnum</i>	15
AFFORIA	thifensulfuron	<i>Harmony</i>	2	KEYSTONE NXT (Keystone LA NXT)	acetochlor	<i>Surpass NXT</i>	15
	tribenuron	<i>Express</i>	2		atrazine	<i>AAtrex</i>	5
	flumioxazin	<i>Valor</i>	14		2,4-D	<i>2,4-D, others</i>	4
AGILITY SG	dicamba	<i>Clarity</i>	4	KOCHIAVDRE	fluroxypyr	<i>Starane</i>	4
	thifensulfuron	<i>Harmony</i>	2		bromoxynil	<i>Maestro</i>	6
ALLY EXTRA	tribenuron	<i>Express</i>	2	KYBER	flumioxazin	<i>Valor</i>	14
	metsulfuron	<i>Ally</i>	2		pyroxasulfone	<i>Zidua</i>	15
ANTHEM FLEX	thifensulfuron	<i>Harmony</i>	2	LEADOFF	metribuzin	<i>Metribuzin</i>	5
	tribenuron	<i>Express</i>	2		rimsulfuron	<i>Resolve</i>	2
ANTHEM MAXX	metsulfuron	<i>Ally</i>	2	LEXAR EZ	thifensulfuron	<i>Harmony</i>	2
	pyroxasulfone	<i>Zidua</i>	15		mesotrione	<i>Callisto</i>	27
ARMERON PRO	carfentrazone	<i>Aim</i>	14	LUMAX EZ	s-metolachlor	<i>Dual II Magnum</i>	15
	fluthiacet	<i>Cadet</i>	14		atrazine	<i>AAtrex</i>	5
AUTHORITY ASSIST	topramezone	<i>Armezon</i>	27	MARVEL	fluthiacet	<i>Cadet</i>	14
	dimethenamid-P	<i>Outlook</i>	15		fomesafen	<i>Flexstar</i>	14
AUTHORITY EDGE	sulfentrazone	<i>Spartan</i>	14	NOVIXID	florpyrauxifen	<i>Loyant</i>	4
	pyroxasulfone	<i>Zidua</i>	15		penoxsulam	<i>Grasp</i>	2
AUTHORITY ELITE	sulfentrazone	<i>Spartan</i>	14	OBEY	clomazone	<i>Command 3ME</i>	13
	s-metolachlor	<i>Dual Magnum</i>	15		quinclorac	<i>Facet</i>	4
AUTHORITY FIRST	sulfentrazone	<i>Spartan</i>	14	OPENSKY	pyroxasulam	<i>PowerFlex HL</i>	2
	cloransulam	<i>FirstRate</i>	2		fluroxypyr	<i>Starane Ultra</i>	4
AUTHORITY MTZ	sulfentrazone	<i>Spartan</i>	14	OPTILL	saflufenacil	<i>Sharpen</i>	14
	metribuzin	<i>Metribuzin</i>	5		imazethapyr	<i>Pursuit</i>	2
AUTHORITY SUPREME	sulfentrazone	<i>Spartan</i>	14	OPTILL PRO	saflufenacil	<i>Sharpen</i>	14
	pyroxasulfone	<i>Zidua</i>	15		imazethapyr	<i>Pursuit</i>	2
AUTHORITY XL (Authority Maxx)	sulfentrazone	<i>Spartan</i>	14	ORION	dimethenamid-P	<i>Outlook</i>	15
	chlorimuron	<i>Classic</i>	2		florasulam	-----	2
AUTUMN SUPER	iodosulfuron	<i>Autumn</i>	2	OSPREY XTRA	MCPA	<i>MCPA</i>	4
	thiencarbazone	<i>Varro</i>	2		mesosulfuron	<i>Osprey</i>	2
AXIAL BOLD	pinoxaden	<i>Axial XL</i>	1	PANDFLEX	thiencarbazone	<i>Varro</i>	2
	fenoxaprop	<i>Ricestar</i>	1		thifensulfuron	<i>Harmony</i>	2
AXIAL STAR	pinoxaden	<i>Axial XL</i>	1	PERFECTMATCH	tribenuron	<i>Express</i>	2
	fluroxypyr	<i>Starane</i>	4		clopyralid	<i>Stinger</i>	4
BASIS BLEND	rimsulfuron	<i>Resolve</i>	2	PERPETUO	fluroxypyr	<i>Starane Ultra</i>	4
	thifensulfuron	<i>Harmony</i>	2		pyroxasulam	<i>PowerFlex HL</i>	2
BETAMIX	desmedipham	<i>Betenex</i>	5	PERMIT PLUS	thifensulfuron	<i>Harmony</i>	2
	phenmedipham	-----	5		halosulfuron	<i>Permit</i>	2
BICEP II MAGNUM (Bicep Lite II Magnum)	s-metolachlor	<i>Dual II Magnum</i>	15	PIXARO EC	flumiclorac	<i>Resource</i>	14
	atrazine	<i>AAtrex</i>	5		pyroxasulfone	<i>Zidua</i>	15
BOUNDARY	s-metolachlor	<i>Dual Magnum</i>	15	PREFIX	fluroxypyr	<i>Starane</i>	4
	metribuzin	<i>Metribuzin</i>	5		halaxifen	<i>Elevore</i>	4
BRAKE F16	fomesafen	<i>Flexstar</i>	14	PROGRESS	s-metolachlor	<i>Dual Magnum</i>	15
	fluridone	<i>Sonar</i>	12		fomesafen	<i>Reflex</i>	14
BRAKE FX	fluometuron	<i>Cotoran</i>	5	PULSAR	desmedipham	<i>Betenex</i>	5
	fluridone	<i>Sonar</i>	12		phenmedipham	-----	5
BROADAXE XC	s-metolachlor	<i>Dual Magnum</i>	15	QUELEX	ethofumesate	<i>Norton</i>	16
	sulfentrazone	<i>Spartan 4F</i>	14		dicamba	<i>Clarity</i>	4
BRONATE	bromoxynil	<i>Maestro</i>	6	RAVE	fluroxypyr	<i>Starane</i>	4
	MCPA	<i>MCPA</i>	4		halaxifen	<i>Elevore</i>	4
CALLISTO GT	mesotrione	<i>Callisto</i>	27	RAZE	florasulam	-----	2
	glyphosate	<i>glyphosate</i>	9		triasulfuron	<i>Amber</i>	2
CALLISTO XTRA	mesotrione	<i>Callisto</i>	27	REALM Q	dicamba	<i>Clarity</i>	4
	atrazine	<i>AAtrex</i>	5		flucarbazone	<i>Everest</i>	2
CANOPY	chlorimuron	<i>Classic</i>	2	REBELEX	fluroxypyr	<i>Starane</i>	4
	metribuzin	<i>Metribuzin</i>	5		rimsulfuron	<i>Resolve</i>	2
CANOPY EX	chlorimuron	<i>Classic</i>	2	RESICORE	mesotrione	<i>Callisto</i>	27
	tribenuron	<i>Express</i>	2		cyhalofop	<i>Clincher</i>	1
CAPRENO	thiencarbazone	<i>Varro</i>	2	REVOLVE Q	penoxsulam	<i>Grasp</i>	2
	tembotrione	<i>Laudis</i>	27		clopyralid	<i>Stinger</i>	4
CARNIVORE	MCPA	<i>MCPA</i>	4	REVULIN Q	acetochlor	<i>Surpass NXT</i>	15
	clopyralid	<i>Stinger</i>	4		mesotrione	<i>Callisto</i>	27
CHEETAH MAX	bromoxynil	<i>Maestro</i>	6	RIMFIRE MAX	rimsulfuron	<i>Resolve</i>	2
	glufosinate	<i>Liberty</i>	10		thifensulfuron	<i>Harmony</i>	2
CINCH ATZ (Cinch ATZ Lite)	fomesafen	<i>Reflex</i>	14	ROUNDUP XTEND*	nicosulfuron	<i>Accent Q</i>	2
	s-metolachlor	<i>Dual II Magnum</i>	15		mesotrione	<i>Callisto</i>	27
CLEARPATH	quinclorac	<i>Facet</i>	4	SENTRALLAS	propoxycarbazone	<i>Olympus</i>	2
	imazethapyr	<i>Newpath</i>	2		mesosulfuron	<i>Osprey</i>	2
COLT + SALVO (Trump Card)	2,4-D	<i>2,4-D</i>	4	SEQUENCE	dicamba	<i>XtendiMax</i>	4
	fluroxypyr	<i>Starane</i>	4		glyphosate	<i>glyphosate</i>	9
COLT + SWORD	MCPA	<i>MCPA</i>	4	SHARPEX	thifensulfuron	<i>Harmony</i>	2