HERBICIDE CLASSIFICATION

REPEATED USE OF HERBICIDES WITH THE SAME SITE OF ACTION CAN RESULT IN THE DEVELOPMENT OF HERBICIDE-RESISTANT WEED POPULATIONS.

TakeACTION HERBICIDE-RESISTANCE MANAGEMENT

by MODE OF ACTION *(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.

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.

SITE OF ACTION GROUP	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)	15	Aryloxyphenoxypropionate (fops)	clodinafop	***Discover NG***
				cyhalofop	***Clincher***
				fenoxaprop	***Ricestar, Tecoma,*** *others*
				fluazifop	***Fusilade DX***
				quizalofop	***Assure II, Targa***
			Cyclohexanedione (dims)	clethodim	***Select Max,*** *others*
				sethoxydim	***Poast, Poast Plus***
			Phenylpyrazolin	pinoxaden	***Axial XL***
AMINO ACID SYNTHESIS INHIBITORS					
2	ALS INHIBITORS (acetolactate synthase)	45	Imidazolinone	imazamox	***Raptor, Beyond***
				imazapic	***Plateau***
				imazaquin	***Scepter***
				imazethapyr	***Pursuit, Newpath***
			Pyrimidinylthiobenzoic acid	bispyribac	***Regiment***
				pyrithiobac	***Staple***
			Sulfonylaminocarbonyl-triazolinones	flucarbazone	***Everest, Pre-Pare***
				propoxycarbazone	***Olympus***
				thiencarbazone	*component of* ***Capreno,*** *others*
			Sulfonylurea	bensulfuron	***Londax***
				chlorimuron	***Classic***
				chlorsulfuron	***Glean***
				foramsulfuron	***Option***
				halosulfuron	***Permit***
				iodosulfuron	***Autumn***
				mesosulfuron	***Osprey***
				metsulfuron	***Ally***
				nicosulfuron	***Accent Q***
				orthosulfamuron	***Strada***
				primisulfuron	***Beacon***
				prosulfuron	***Peak***
				rimsulfuron	***Resolve, Matrix***
				sulfosulfuron	***Maverick***
				thifensulfuron	***Harmony***
				triasulfuron	***Amber***
				tribenuron	***Express***
				trifloxysulfuron	***Envoke***
				triflusulfuron	***UpBeet***
			Triazolopyrimidine	cloransulam	***FirstRate***
				florasulam	*component of* ***Orion***
				flumetsulam	***Python***
				penoxsulam	***Grasp***
				pyroxsulam	***PowerFlex HL***
9	EPSP SYNTHASE INHIBITOR (5-enolpyruvyl-shikimate-3-phosphate)	14	None accepted	glyphosate	***Roundup, Touchdown,*** *several*
GROWTH REGULATORS					
4	TIR1 AUXIN RECEPTORS (synthetic auxins)	10	Benzoic acid	dicamba	***Banvel, Clarity,*** *others*
			Carboxylic acid	clopyralid	***Stinger***
				fluroxypyr	***Starane***
				triclopyr	***Grandstand***
				quinclorac	***Facet, Paramount***
			Phenoxy	2,4-D	***2,4-D,*** *others*
				MCPA	***MCPA,*** *others*
19	AUXIN TRANSPORT INHIBITOR	0	Semicarbazone	diflufenzopyr	*component of* ***Status***
PHOTOSYNTHESIS INHIBITORS					
5	PHOTOSYSTEM II INHIBITORS (different binding than 6 & 7)	26	Phenylcarbamate	desmedipham	***Betenex***
				phenmedipham	*component of* ***Betamix***
			Triazine	atrazine	***AAtrex,*** *others*
				prometryn	***Caparol***
				simazine	***Princep***
			Triazinone	hexazinone	***Velpar***
				metribuzin	***Sencor,*** *others*
			Uracil	terbacil	***Sinbar***
6	PHOTOSYSTEM II INHIBITORS (different binding than 5 & 7)	1	Benzothiadiazole	bentazon	***Basagran***
			Nitrile	bromoxynil	***Buctril,*** *others*
7	PHOTOSYSTEM II INHIBITORS (different binding than 5 & 6)	8	Amide	propanil	***SuperWham***
			Urea	diuron	***Direx, Karmex***
				fluometuron	***Cotoran***
				linuron	***Lorox, Linex***
NITROGEN METABOLISM INHIBITOR					
10	GLUTAMINE SYNTHETASE INHIBITOR	1	Organophosphorus	glufosinate	***Liberty***
PIGMENT INHIBITORS					
13	DITERPENE BIOSYNTHESIS INHIBITOR	1	Isoxazolidinone	clomazone	***Command***
27	HPPD INHIBITORS	2	Isoxazole	isoxaflutole	***Balance Flexx***
			Pyrazole	pyrasulfotole	*component of* ***Huskie***
			Pyrazolone	topramezone	***Armezon, Impact***
			Triketone	mesotrione	***Callisto***
				tembotrione	***Laudis***
CELL MEMBRANE DISRUPTERS					
14	PPO INHIBITORS	2	Aryl triazinone	sulfentrazone	***Spartan***
				carfentrazone	***Aim***
				fluthiacet	***Cadet***
			Diphenylether	acifluorfen	***Ultra Blazer***
				fomesafen	***Flexstar, Reflex,*** *others*
				lactofen	***Cobra, Phoenix***
			N-phenylphthalimide	flumiclorac	***Resource***
				flumioxazin	***Valor***
			Pyrimidinedione	saflufenacil	***Sharpen***
22	PHOTOSYSTEM I ELECTRON DIVERTER	5	Bipyridylium	diquat	***Reglone***
				paraquat	***Gramoxone SL***
SEEDLING ROOT GROWTH INHIBITORS					
3	MICROTUBULE INHIBITORS	6	Amide	pronamide	***Kerb***
			Dinitroaniline	ethalfluralin	***Sonalan***
				pendimethalin	***Prowl H$_2$O,*** *others*
				trifluralin	***Treflan,*** *others*
SEEDLING SHOOT GROWTH INHIBITORS					
8	LIPID SYNTHESIS INHIBITOR (not ACCase)	5	Thiocarbamate	butylate	***Sutan +***
				cycloate	***Ro-Neet***
				EPTC	***Eradicane, Eptam***
				thiobencarb	***Bolero***
				triallate	***Far-Go***
15	LONG-CHAIN FATTY ACID INHIBITORS	1	Chloroacetamide	acetochlor	***Degree, Harness, Surpass, Topnotch, Warrant,*** *others*
				alachlor	***Intrro, Micro-Tech***
				s-metolachlor	***Dual Magnum,*** *others*
				dimethenamid-P	***Outlook***
			Oxyacetamide	flufenacet	***Define***
			Pyrazole	pyroxasulfone	***Zidua***
16	SPECIFIC SITE UNKNOWN	0	Benzofurane	ethofumesate	***Nortron***
UNDEFINED					
17	NUCLEIC ACID INHIBITOR	1	Arsenical	MSMA	***MSMA***

PREMIX	COMPONENT ACTIVE INGREDIENT	COMPONENT TRADE NAME®	COMPONENT SITE OF ACTION GROUP
AFFINITY BROADSPEC (Affinity Tankmix)	thifensulfuron	***Harmony***	2
	tribenuron	***Express***	2
AGILITY SG	dicamba	***Clarity***	4
	thifensulfuron	***Harmony***	2
	tribenuron	***Express***	2
	metsulfuron	***Ally***	2
ALLY EXTRA	thifensulfuron	***Harmony***	2
	tribenuron	***Express***	2
	metsulfuron	***Ally***	2
ANTHEM	pyroxasulfone	***Zidua***	15
	fluthiacet	***Cadet***	14
ANTHEM ATZ	pyroxasulfone	***Zidua***	15
	fluthiacet	***Cadet***	14
	atrazine	***AAtrex***	5
AUTHORITY ASSIST	sulfentrazone	***Spartan***	14
	imazethapyr	***Pursuit***	2
AUTHORITY ELITE	sulfentrazone	***Spartan***	14
	s-metolachlor	***Dual Magnum***	15
AUTHORITY FIRST	sulfentrazone	***Spartan***	14
	cloransulam	***FirstRate***	2
AUTHORITY MTZ	sulfentrazone	***Spartan***	14
	metribuzin	***Sencor***	5
AUTHORITY XL (Authority Maxx)	sulfentrazone	***Spartan***	14
	chlorimuron	***Classic***	2
AUTUMN SUPER	iodosulfuron	***Autumn***	2
	thiencarbazone	***-----***	2
AXIAL STAR	pinoxaden	***Axial XL***	1
	fluroxypyr	***Starane***	4
BASIS BLEND	rimsulfuron	***Resolve***	2
	thifensulfuron	***Harmony***	2
BETAMIX	desmedipham	***Betenex***	5
	phenmedipham	***-----***	5
BICEP II MAGNUM (Bicep Lite II Magnum)	*s*-metolachlor	***Dual II Magnum***	15
	atrazine	***AAtrex***	5
BOUNDARY	*s*-metolachlor	***Dual Magnum***	15
	metribuzin	***Sencor***	5
BREAKFREE ATZ (Breakfree ATZ Lite)	acetochlor	***Breakfree***	15
	atrazine	***AAtrex***	5
BROADAXE	*s*-metolachlor	***Dual Magnum***	15
	sulfentrazone	***Spartan***	14
BROADHEAD	carfentrazone	***Aim***	14
	quinclorac	***Facet***	4
BRONATE	bromoxynil	***Buctril***	6
	MCPA	***MCPA***	4
BULLET	alachlor	***Micro-Tech***	15
	atrazine	***AAtrex***	5
CALLISTO XTRA	mesotrione	***Callisto***	27
	atrazine	***AAtrex***	5
CANOPY	chlorimuron	***Classic***	2
	metribuzin	***Sencor***	5
CANOPY EX	chlorimuron	***Classic***	2
	tribenuron	***Express***	2
CAPRENO	thiencarbazone	***-----***	2
	tembotrione	***Laudis***	27
CINCH ATZ (Cinch ATZ Lite)	*s*-metolachlor	***Dual II Magnum***	15
	atrazine	***AAtrex***	5
CLEARPATH	quinclorac	***Facet***	4
	imazethapyr	***Newpath***	2
CORVUS	thiencarbazone	***-----***	2
	isoxaflutole	***Balance Flexx***	27
CURTAIL	clopyralid	***Stinger***	4
	2,4-D	***2,4-D***	4
CURTAIL M	clopyralid	***Stinger***	4
	MCPA	***MCPA***	4
DEGREE XTRA	acetochlor	***Degree***	15
	atrazine	***AAtrex***	5
ENLITE	chlorimuron	***Classic***	2
	thifensulfuron	***Harmony***	2
	flumioxazin	***Valor***	14
ENVIVE	chlorimuron	***Classic***	2
	thifensulfuron	***Harmony***	2
	flumioxazin	***Valor***	14
EXPERT	*s*-metolachlor	***Dual Magnum***	15
	atrazine	***AAtrex***	5
	glyphosate	***glyphosate***	9
EXTREME	imazethapyr	***Pursuit***	2
	glyphosate	***glyphosate***	9
FIELD MASTER	acetochlor	***Harness***	15
	atrazine	***AAtrex***	5
	glyphosate	***glyphosate***	9
FIERCE	flumioxazin	***Valor***	14
	pyroxasulfone	***Zidua***	15
FIERCE XLT*	flumioxazin	***Valor***	14
	pyroxasulfone	***Zidua***	15
	chlorimuron	***Classic***	2
FINESSE	chlorsulfuron	***Glean***	2
	metsulfuron	***Ally***	2
FINESSE GRASS AND BROADLEAF	chlorsulfuron	***Glean***	2
	flucarbazone	***Everest***	2
FLEXSTAR GT	fomesafen	***Flexstar***	14
	glyphosate	***glyphosate***	9
FOXFIRE	fenoxaprop	***Tecoma***	1
	pinoxaden	***Axial XL***	1
FULTIME	acetochlor	***TopNotch***	15
	atrazine	***AAtrex***	5
FUSION	fluazifop	***Fusilade DX***	1
	fenoxaprop	***Puma***	1
GANGSTER	flumioxazin	***Valor***	14
	cloransulam	***FirstRate***	2
GOLDSKY	pyroxsulam	***PowerFlex HL***	2
	florasulam	***-----***	2
	fluroxypyr	***Starane***	4
GUARDSMAN MAX (G-Max Lite)	dimethenamid-P	***Outlook***	15
	atrazine	***AAtrex***	5
HALEX GT	*s*-metolachlor	***Dual Magnum***	15
	mesotrione	***Callisto***	27
	glyphosate	***glyphosate***	9
HARNESS XTRA	acetochlor	***Harness***	15
	atrazine	***AAtrex***	5
HORNET	clopyralid	***Stinger***	4
	flumetsulam	***Python***	2
HUSKIE	pyrasulfotole	***-----***	27
	bromoxynil	***Buctril***	6
HUSKIE COMPLETE	pyrasulfotole	***-----***	27
	bromoxynil	***Buctril***	6
	thiencarbazone	***-----***	2
INSTIGATE	rimsulfuron	***Resolve, Matrix***	2
	mesotrione	***Callisto***	27
KEYSTONE (Keystone LA)	acetochlor	***Surpass***	15
	atrazine	***AAtrex***	5
LEXAR EZ	mesotrione	***Callisto***	27
	s-metolachlor	***Dual II Magnum***	15
	atrazine	***AAtrex***	5
LUMAX EZ	mesotrione	***Callisto***	27
	s-metolachlor	***Dual II Magnum***	15
	atrazine	***AAtrex***	5
MARKSMAN	dicamba	***Clarity***	4
	atrazine	***AAtrex***	5
MARVEL	fluthiacet	***Cadet***	14
	fomesafen	***Flexstar***	14
NORTHSTAR	primisulfuron	***Beacon***	2
	dicamba	***Clarity***	4
OBEY	clomazone	***Command***	13
	quinclorac	***Facet***	4
OPTILL	saflufenacil	***Sharpen***	14
	imazethapyr	***Pursuit***	2
OPTILL PRO	saflufenacil	***Sharpen***	14
	imazethapyr	***Pursuit***	2
	dimethenamid-P	***Outlook***	15
ORION	florasulam	***-----***	2
	MCPA	***MCPA***	4
PERMIT PLUS	thifensulfuron	***Harmony***	2
	halosulfuron	***Permit***	2
PRIORITY	carfentrazone	***Aim***	14
	halosulfuron	***Permit***	2
PREFIX	*s*-metolachlor	***Dual Magnum***	15
	fomesafen	***Reflex***	14
PREQUEL	rimsulfuron	***Resolve***	2
	isoxaflutole	***Balance Pro***	27
PROGRESS	desmedipham	***Betenex***	5
	phenmedipham	***-----***	5
	ethofumesate	***Nortron***	16
PULSAR	dicamba	***Clarity***	4
	fluroxypyr	***Starane***	4
PURSUIT PLUS	imazethapyr	***Pursuit***	2
	pendimethalin	***Prowl***	3
RAVE	triasulfuron	***Amber***	2
	dicamba	***Clarity***	4
RAZE	flucarbazone	***Everest***	2
	fluroxypyr	***Starane***	4
REALM Q	rimsulfuron	***Resolve***	2
	mesotrione	***Callisto***	27
REBELEX	cyhalofop	***Clincher***	1
	penoxsulam	***Grasp***	2
REQUIRE Q	rimsulfuron	***Resolve***	2
	dicamba	***Clarity***	4
RESOLVE Q	rimsulfuron	***Resolve***	2
	thifensulfuron	***Harmony***	2
REZULT	bentazon	***Basagran***	6
	sethoxydim	***Poast***	1
RIMFIRE MAX	propoxycarbazone	***Olympus***	2
	mesosulfuron	***Osprey***	2
SEQUENCE	*s*-metolachlor	***Dual Magnum***	15
	glyphosate	***glyphosate***	9
SHOTGUN	atrazine	***AAtrex***	5
	2,4-D	***2,4-D***	4
SONIC	sulfentrazone	***Spartan***	14
	cloransulam	***FirstRate***	2
SPARTAN CHARGE	sulfentrazone	***Spartan***	14
	carfentrazone	***Aim***	14
SPIRIT	prosulfuron	***Peak***	2
	primisulfuron	***Beacon***	2
STARANE FLEX	florasulam	***-----***	2
	fluroxypyr	***Starane***	4
STARANE NXT	fluroxypyr	***Starane***	4
	bromoxynil	***Buctril***	6
STATUS	diflufenzopyr	***-----***	19
	dicamba	***Clarity***	4
STEADFAST Q	nicosulfuron	***Accent Q***	2
	rimsulfuron	***Resolve***	2
SUPREMACY	fluroxypyr	***Starane***	4
	thifensulfuron	***Harmony***	2
	tribenuron	***Express***	2
SUPREND	prometryn	***Caparol***	5
	trifloxysulfuron	***Envoke***	2
STORM	bentazon	***Basagran***	6
	acifluorfen	***Ultra Blazer***	14
SURESTART	acetochlor	***Surpass***	15
	clopyralid	***Stinger***	4
	flumetsulam	***Python***	2
SYNCHRONY	chlorimuron	***Classic***	2
	thifensulfuron	***Harmony***	2
TRIPLEFLEX	acetochlor	***Harness***	15
	clopyralid	***Stinger***	4
	flumetsulam	***Python***	2
TRUMP CARD	2,4-D	***2,4-D***	4
	fluroxypyr	***Starane***	4
VALOR XLT	flumioxazin	***Valor***	14
	chlorimuron	***Classic***	2
VELPAR ALFAMAX	hexazinone	***Velpar***	5
	diuron	***Karmex***	7
VERDICT	saflufenacil	***Sharpen***	14
	dimethenamid-P	***Outlook***	15
WELD	MCPA	***MCPA***	4
	fluroxypyr	***Starane***	4
	clopyralid	***Stinger***	4
WIDEMATCH	clopyralid	***Stinger***	4
	fluroxypyr	***Starane***	4
WOLVERINE	fenoxaprop	***Tecoma***	1
	pyrasulfotole	***-----***	27
	bromoxynil	***Buctril***	6
YUKON	dicamba	***Banvel***	4
	halosulfuron	***Permit***	2
ZEMAX	mesotrione	***Callisto***	27
	s-metolachlor	***Dual II Magnum***	15

*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.

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