

# HERBICIDE CLASSIFICATION

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

## MODE OF ACTION by 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.

SITE OF ACTION GROUP	NUMBER OF RESISTANT WEED SPECIES IN U.S.	CHEMICAL FAMILY	ACTIVE INGREDIENT	PRODUCT EXAMPLES (TRADE NAME*)
<b>1</b> ACCASE INHIBITORS (acetyl CoA carboxylase)	15	Aryloxyphenoxypropionate (fops)	clodinafop cyhalofop fenoxaprop fluzifop quizalofop	<i>Discover NG</i> <i>Clincher</i> <i>Ricestar, Tecoma, others</i> <i>Fusilade DX</i> <i>Assure II, Targa</i>
		Cyclohexanedione (dime)	clethodim sethoxydim	<i>Select Max, others</i> <i>Poast, Poast Plus</i>
		Phenylpyrazolin	pinoxaden	<i>Axial XL</i>
<b>2</b> ALS INHIBITORS (acetolactate synthase)	45	Imidazolinone	imazamox imazapic imazaquin imazethapyr	<i>Raptor, Beyond, Clearmax</i> <i>Plateau</i> <i>Scepter</i> <i>Pursuit, Newpath</i>
		Pyrimidinylthiobenzoic acid	bispyribac pyrithiobac	<i>Regiment</i> <i>Staple</i>
		Sulfonylamino carbonyl-triazolinones	flucarbazone propoxycarbazone thiencarbazone	<i>Everest, Pre-Para, Sierra</i> <i>Olympus</i> <i>Varro</i>
			bensulfuron chlorimuron chlorsulfuron halosulfuron iodosulfuron mesosulfuron mesosulfuron metsulfuron nicosulfuron orthosulfuron primisulfuron prosulfuron rimsulfuron sulfosulfuron thifensulfuron triasulfuron tribenuron triflousulfuron triflusulfuron cloransulam florasulam flumetsulam penoxsulam pyroxulam	<i>Londax</i> <i>Classic</i> <i>Glean</i> <i>Permit</i> <i>Autumn</i> <i>Osprey</i> <i>Ally</i> <i>Accent Q</i> <i>Strada</i> <i>Beacon</i> <i>Peak</i> <i>Resolve, Matrix</i> <i>Maverick</i> <i>Harmony</i> <i>Amber</i> <i>Express</i> <i>Envoke</i> <i>UpBeet</i> <i>FirstRate</i> component of <i>Orion</i> <i>Python, Accolade</i> <i>Grasp</i> <i>PowerFlex HL</i>
<b>9</b> EPSP SYNTHASE INHIBITOR (5-enolpyruvyl-shikimate-3-phosphate)	14	Organophosphorus	glyphosate	<i>Roundup, Touchdown, several</i>
<b>4</b> TIRI AUXIN RECEPTORS (synthetic auxins)	8	Arylpicolinate	halauxifen	component of <i>Quelex*</i>
		Benzoic acid	dicamba clopyralid	<i>Banvel, Clarity, DIFlexx*, others</i> <i>Stinger</i>
		Carboxylic acid	fluroxypyr triclopyr quinclorac	<i>Starane</i> <i>Grandstand</i> <i>Facet, Paramount</i>
		Phenoxy	2,4-D MCPA	<i>2,4-D, others</i> <i>MCPA, others</i>
<b>19</b> AUXIN TRANSPORT INHIBITOR	0	Semicarbazone	diffenozopyr	component of <i>Status</i>
<b>5</b> PHOTOSYSTEM II INHIBITORS (different binding than 6 & 7)	26	Phenylcarbamate	desmedipham phenmedipham	<i>Betenex</i> component of <i>Betamix</i>
		Triazine	atrazine prometryn simazine	<i>AATrex, others</i> <i>Caprol</i> <i>Princep</i>
		Triazinone	hexazinone metribuzin	<i>Velpar</i> <i>Metribuzin, others</i>
		Uracil	terbacil	<i>Sinbar</i>
<b>6</b> PHOTOSYSTEM II INHIBITORS (different binding than 5 & 7)	1	Benzothiadiazole	benzazon	<i>Basagran, others</i>
		Nitride	bromoxynil	<i>Buctril, others</i>
<b>7</b> PHOTOSYSTEM II INHIBITORS (different binding than 5 & 6)	9	Amide	propanil	<i>SuperWham</i>
		Urea	diuron fluometuron linuron	<i>Direx, Karmex</i> <i>Cotoran</i> <i>Lorox, Linex</i>
<b>10</b> NITROGEN METABOLISM INHIBITOR	1	Organophosphorus	glufosinate	<i>Liberty</i>
<b>12</b> PHYTOENE DESATURASE (PDS) INHIBITOR	1	none recognized	fluridone	<i>Sonar</i>
<b>13</b> DOXP SYNTHASE INHIBITOR (1-DEOXY-D-XYLULOSE 5-PHOSPHATE)	1	Isoxazolidinone	clomazone	<i>Command</i>
<b>27</b> HPPD INHIBITORS	2	Isoxazole	isoxaflutole	<i>Balance Flexx</i>
		Pyrazole	pyrasulfotole	component of <i>Huskie</i>
		Pyrazolone	topramezone	<i>Armeson, Impact</i>
			mesotrione triketone	<i>Callisto</i> <i>Laudis</i>
			bicyclopyrone	component of <i>Acuron*</i>
<b>14</b> PPO INHIBITORS	2	Aryl triazinone	sulfentrazone carfentrazone fluthiacet	<i>Spartan</i> <i>Aim</i> <i>Cadet</i>
		Diphenylether	acifluorfen fomesafen lactofen	<i>Ultra Blazer</i> <i>Flexstar, Reflex, others</i> <i>Cobra, Phoenix</i>
		N-phenylphthalimide	flumiclorac	<i>Resource</i>
		Pyrimidinedione	flumioxazin saflufenacil	<i>Valor, others</i> <i>Sharpen</i>
<b>22</b> PHOTOSYSTEM I ELECTRON DIVERTER	5	Bipyridylium	diquat paraquat	<i>Reglone</i> <i>Gramoxone SL</i>
<b>3</b> MICROTUBULE INHIBITORS	6	Benzamide	pronamide	<i>Kerb</i>
			ethalfuralin	<i>Sonalan</i>
		Dinitroaniline	pendimethalin trifluralin	<i>Prowl H<sub>2</sub>O, others</i> <i>Treflan, others</i>
<b>8</b> LIPID SYNTHESIS INHIBITOR (not ACCase)	5	Thiocarbamate	butylate cycloate EPTC thiobencarb triallate	<i>Sutan +</i> <i>Ro-Neet</i> <i>Eradicane, Eptam</i> <i>Bolero</i> <i>Far-Go</i>
<b>15</b> LONG-CHAIN FATTY ACID INHIBITORS	1	Chloroacetamide	acetochlor alachlor	<i>Degree, Harness, Surpass NXT, Topnotch, Warrant, others</i> <i>Intra, Micro-Tech</i>
			s-metolachlor dimethenamid-P	<i>Dual Magnum, others</i> <i>Outlook</i>
		Oxyacetamide	flufenacet	<i>Define</i>
		Pyrazole	pyroxasulfone	<i>Zidua</i>
<b>16</b> SPECIFIC SITE UNKNOWN	0	Benzoifurane	ethofumesate	<i>Norton</i>
<b>17</b> NUCLEIC ACID INHIBITOR	1	Arsenical	MSMA	<i>MSMA</i>



## 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
ACURON*	bicyclopyrone	-----	27
	mesotrione	Callisto	27
	atrazine	AATrex	5
	s-metolachlor	Dual II Magnum	15
AFFINITY BROADSPEC (Affinity Tankmix)	thifensulfuron	Harmony	2
	tribenuron	Express	2
	thifensulfuron	Harmony	2
	tribenuron	Express	2
AFFORIA	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	pyroxasulfone	Zidua	15
	fluthiacet	Cadet	14
ANTHEM ATZ	pyroxasulfone	Zidua	15
	fluthiacet	Cadet	14
	atrazine	AATrex	5
ANTHEM FLEX	pyroxasulfone	Zidua	15
	carfentrazone	Aim	14
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	Metribuzin	5
AUTHORITY XL (Authority Max)	sulfentrazone	Spartan	14
	chlorimuron	Classic	2
AUTUMN SUPER	iodosulfuron	Autumn	2
	thiencarbazone	Varro	2
AXIAL STAR	pinoxaden	Axial XL	1
	fluroxypyr	Starane	4
	rimsulfuron	Resolve	2
BASIS BLEND	thifensulfuron	Harmony	2
	desmedipham	Betenex	5
BETAMIX	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
BRAKE F2	fluridone	Sonar	12
BREAKFREE NXT ATZ (Breakfree NXT Lite)	acetochlor	Breakfree NXT	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 GT	mesotrione	Callisto	27
	glyphosate	glyphosate	9
CALLISTO XTRA	mesotrione	Callisto	27
	atrazine	AATrex	5
CANOPY	chlorimuron	Classic	2
	metribuzin	Metribuzin	5
CANOPY EX	chlorimuron	Classic	2
	tribenuron	Express	2
CAPRENO	thiencarbazone	Varro	2
	tembotrione	Laudis	27
CARNIVORE	MCPA	MCPA	4
	clopyralid	Stinger	4
	bromoxynil	Buctril	6
CINCH ATZ (Cinch ATZ Lite)	s-metolachlor	Dual II Magnum	15
	atrazine	AATrex	5
	quinclorac	Facet	4
CLEARPATH	imazethapyr	Newpath	2
COLT + SALVO (Trump Card)	2,4-D	2,4-D	4
	fluroxypyr	Starane	4
COLT + SWORD	MCPA	MCPA	4
	fluroxypyr	Starane	4
	thiencarbazone	Varro	2
CORVUS	isoxaflutole	Balance Flexx	27
CURTAL	clopyralid	Stinger	4
	2,4-D	2,4-D	4
CURTAL M	clopyralid	Stinger	4
	MCPA	MCPA	4
DEGREE XTRA	acetochlor	Degree	15
	atrazine	AATrex	5
ENLIST DUO	2,4-D	2,4-D	4
	glyphosate	glyphosate	9
	chlorimuron	Classic	2
ENLITE	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
	acetochlor	Harness	15
FIELD MASTER	atrazine	AATrex	5
	glyphosate	glyphosate	9
FIERCE	flumioxazin	Valor	14
	pyroxasulfone	Zidua	15
	flumioxazin	Valor	14
FIERCE XLT	pyroxasulfone	Zidua	15
	chlorimuron	Classic	2
	chlorsulfuron	Glean	2
FINESSE	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
	acetochlor	TopNotch	15
FULTIME NXT	atrazine	AATrex	5
FUSION	fluzifop	Fusilade DX	1
	fenoxaprop	Puma	1
	flumioxazin	Valor	14
GANGSTER	cloransulam	FirstRate	2
	pyroxasulfone	PowerFlex HL	2
	florasulam	-----	2
GOLDSKY	fluroxypyr	Starane	4
	dimethenamid-P	Outlook	15
GUARDSMAN MAX (G-Max Lite)	atrazine	AATrex	5
	s-metolachlor	Dual Magnum	15
	mesotrione	Callisto	27
HALEX GT	glyphosate	glyphosate	9
	acetochlor	Harness	15
	atrazine	AATrex	5
	flumetsulam	Python	2
	chlorsulfuron	Glean	2
	chlorsulfuron	Glean	2
	flucarbazone	Everest	2
	fomesafen	Flexstar	14
	glyphosate	glyphosate	9
	fenoxaprop	Tecoma	1
	pinoxaden	Axial XL	1
	acetochlor	TopNotch	15
	atrazine	AATrex	5
	fluzifop	Fusilade DX	1
	fenoxaprop	Puma	1
	flumioxazin	Valor	14
	cloransulam	FirstRate	2
	pyroxasulfone	PowerFlex HL	2
	florasulam	-----	2
	fluroxypyr	Starane	4
	dimethenamid-P	Outlook	15
	atrazine	AATrex	5
	s-metolachlor	Dual Magnum	15
	mesotrione	Callisto	27
	glyphosate	glyphosate	9
	acetochlor	Harness	15
	clopyralid	Stinger	4
	flumetsulam	Python	2
	flumioxazin	Valor	14
	chlorsulfuron	Glean	2
	chlorsulfuron	Glean	2
	flucarbazone	Everest	2
	fomesafen	Flexstar	14
	glyphosate	glyphosate	9
	fenoxaprop	Tecoma	1
	benzazon	Basagran	6
	hexazinone	Velpar	5
	diuron	Karmex	7
	saflufenacil	Sharpen	14
	dimethenamid-P	Outlook	15
	MCPA	MCPA	4
	fluroxypyr	Starane	4
	clopyralid	Stinger	4
	fluroxypyr	Starane	4
	fenoxaprop	Tecoma	1
	pyrasulfotole	-----	27
	bromoxynil	Buctril	6
	dicamba	Banvel	4
	halosulfuron	Permit	2
	mesotrione	Callisto	27
	s-metolachlor	Dual II Magnum	15
	acetochlor	Harness	15
	atrazine	AATrex	5
	clopyralid	Stinger	4
	flumetsulam	Python	2
	pyrasulfotole	-----	27
	bromoxynil	Buctril	6
	thiencarbazone	Varro	2
	rimsulfuron	Resolve, Matrix	2
	mesotrione	Callisto	27
	acetochlor	Surpass NXT	15
	atrazine	AATrex	5
	rimsulfuron	Resolve	2
	thifensulfuron	Harmony	2
	mesotrione	Callisto	27
	s-metolachlor	Dual II Magnum	15
	atrazine	AATrex	5
	dicamba	Clarity	4
	atrazine	AATrex	5
	mesotrione	Callisto	27
	s-metolachlor	Dual II Magnum	15
	atrazine	AATrex	5
	dicamba	Clarity	4
	atrazine	AATrex	5
	fluthiacet	Cadet	14
	fomesafen	Flexstar	14
	primisulfuron	Beacon	2
	dicamba	Clarity	4
	clomazone	Command	13
	quinclorac	Facet	4
	saflufenacil	Sharpen	14
	imazethapyr	Pursuit	2
	dimethenamid-P	Outlook	15
	florasulam	-----	2
	MCPA	MCPA	4
	thifensulfuron	Harmony	