

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 (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*)	
LIPID SYNTHESIS INHIBITORS					
1 ACCASE INHIBITORS (acetyl CoA carboxylase)	15	Aryloxyphenoxypropionate (fops)	clodinafop	<i>Discover NG</i>	
			cyhalofop	<i>Clincher</i>	
			fenoxaprop	<i>Ricestar, Tecoma, others</i>	
			fluaizifop	<i>Fusilade DX</i>	
Cyclohexanedione (dims)					
Phenylpyrazolin					
AMINO ACID SYNTHESIS INHIBITORS					
2 ALS INHIBITORS (acetolactate synthase)	45	Imidazolinone	imazamox	<i>Raptor, Beyond</i>	
			imazapic	<i>Plateau</i>	
			imazaquin	<i>Scepter</i>	
			imazethapyr	<i>Pursuit, Newpath</i>	
			Pyrimidinylthiobenzoic acid	bispyribac	<i>Regiment</i>
				pyrithiobac	<i>Staple</i>
			Sulfonamidocarbonyl-triazolinones	flucarbazone	<i>Everest, Pre-Pare</i>
				propoxycarbazone	<i>Olympus</i>
				thiencarbazone	component of <i>Capreno, others</i>
				bensulfuron	<i>Londax</i>
				chlormuron	<i>Classic</i>
				chlorsulfuron	<i>Glean</i>
		foramsulfuron		<i>Option</i>	
		halosulfuron		<i>Permit</i>	
		iodosulfuron		<i>Autumn</i>	
		mesosulfuron		<i>Osprey</i>	
		Sulfonyleurea	metalsulfuron	<i>Ally</i>	
			nicosulfuron	<i>Accent Q</i>	
			orthosulfamuron	<i>Strada</i>	
			primisulfuron	<i>Beacon</i>	
			proflucarbazone	<i>Peak</i>	
			rimsulfuron	<i>Resolve, Matrix</i>	
			sulfosulfuron	<i>Maverick</i>	
			thifensulfuron	<i>Harmony</i>	
			triasulfuron	<i>Amber</i>	
			tribenuron	<i>Express</i>	
		Triazolopyrimidine	trifloxysulfuron	<i>Envoke</i>	
			triflusulfuron	<i>UpBeet</i>	
			cloransulam	<i>FirstRate</i>	
florasulam	component of <i>Orion</i>				
flumetsulam	<i>Python</i>				
penoxsulam	<i>Grasp</i>				
pyroxsulam	<i>PowerFlex HL</i>				
9 EPSP SYNTHASE INHIBITOR (5-enolpyruvyl-shikimate-3-phosphate)	14		None accepted	glyphosate	<i>Roundup, Touchdown, several</i>
GROWTH REGULATORS					
4 TIRI AUXIN RECEPTORS (synthetic auxins)	10	Benzoic acid	dicamba	<i>Banvel, Clarity, others</i>	
			clopyralid	<i>Stinger</i>	
		Carboxylic acid	fluroxypyr	<i>Starane</i>	
			triclopyr	<i>Grandstand</i>	
19 AUXIN TRANSPORT INHIBITOR	0	Phenoxy	quinclorac	<i>Facet, Paramount</i>	
			2,4-D	<i>2,4-D, others</i>	
			MCPA	<i>MCPA, others</i>	
			Semicarbazone	diffenozopyr	component of <i>Status</i>
PHOTOSYNTHESIS INHIBITORS					
5 PHOTOSYSTEM II INHIBITORS (different binding than 6 & 7)	26	Phenylcarbamate	desmedipham	<i>Betenex</i>	
			phenmedipham	component of <i>Betamix</i>	
		Triazine	atrazine	<i>AAtrex, others</i>	
			prometryn	<i>Caparol</i>	
			simazine	<i>Princep</i>	
		Triazinone	hexazinone	<i>Velpar</i>	
metribuzin	<i>Sencor, others</i>				
6 PHOTOSYSTEM II INHIBITORS (different binding than 5 & 7)	1	Uracil	terbacil	<i>Sinbar</i>	
7 PHOTOSYSTEM II INHIBITORS (different binding than 5 & 6)	8	Benzothiadiazole	benfotrol	<i>Basagran</i>	
			Nitrile	bromoxynil	<i>Buctril, others</i>
10 GLUTAMINE SYNTHETASE INHIBITOR	1	Organophosphorus	glufosinate	<i>Liberty</i>	
PIGMENT INHIBITORS					
13 DITERPENE BIOSYNTHESIS INHIBITOR	1	Isoxazolidinone	clomazone	<i>Command</i>	
27 HPPD INHIBITORS	2	Isoxazole	isoxaflutole	<i>Balance Flexx</i>	
			Pyrazole	pyrasulfotole	component of <i>Huskie</i>
			Pyrazolone	topramezone	<i>Armezon, Impact</i>
			mesotrione	<i>Callisto</i>	
			Triketone	tembotrione	<i>Laudis</i>
CELL MEMBRANE DISRUPTERS					
14 PPO INHIBITORS	2	Aryl triazinone	sulfentrazone	<i>Spartan</i>	
			carfentrazone	<i>Aim</i>	
			fluthiacet	<i>Cadet</i>	
		Diphenylether	acifluorfen	<i>Ultra Blazer</i>	
			fomesafen	<i>Flexstar, Reflex, others</i>	
			lactofen	<i>Cobra, Phoenix</i>	
		N-phenylphthalimide	flumiclorac	<i>Resource</i>	
			flumioxazin	<i>Valor</i>	
		Pyrimidinedione	saffluenacil	<i>Sharpen</i>	
			diquat	<i>Reglone</i>	
		22 PHOTOSYSTEM I ELECTRON DIVERTER	5	Bipyridylum	paraquat
SEEDLING ROOT GROWTH INHIBITORS					
3 MICROTUBULE INHIBITORS	6	Amide	pronamide	<i>Kerb</i>	
			ethalfuralin	<i>Sonalan</i>	
		Dinitroaniline	pendimethalin	<i>Prowl H₂O, others</i>	
			trifluralin	<i>Treflan, others</i>	
SEEDLING SHOOT GROWTH INHIBITORS					
8 LIPID SYNTHESIS INHIBITOR (not ACCase)	5	Thiocarbamate	butylate	<i>Sutan +</i>	
			cycloate	<i>Ro-Neet</i>	
			EPTC	<i>Eradicane, Eptam</i>	
			thiobencarb	<i>Bolero</i>	
15 LONG-CHAIN FATTY ACID INHIBITORS	1	Chloroacetamide	triallate	<i>Far-Go</i>	
			acetochlor	<i>Degree, Harness, Surpass, Topnotch, Warrant, others</i>	
			alachlor	<i>Intrro, Micro-Tech</i>	
			s-metolachlor	<i>Dual Magnum, others</i>	
			dimethenamid-P	<i>Outlook</i>	
			Oxacetamide	flufenacet	<i>Define</i>
16 SPECIFIC SITE UNKNOWN	0	Benzofuran	ethofumesate	<i>Norton</i>	
UNDEFINED					
17 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
AFFINITY BROADSPEC (Affinity Tankmix)	thifensulfuron tribenuron	<i>Harmony</i> <i>Express</i>	2 6
AGILITY SG	dicamba thifensulfuron tribenuron	<i>Clarity</i> <i>Harmony</i> <i>Express</i>	4 2 2
ALLY EXTRA	metalsulfuron thifensulfuron tribenuron	<i>Ally</i> <i>Harmony</i> <i>Express</i>	2 2 2
ANTHEM	pyroxasulfone fluthiacet	<i>Zidua</i> <i>Cadet</i>	15 14
ANTHEM ATZ	pyroxasulfone fluthiacet atrazine	<i>Zidua</i> <i>Cadet</i> <i>AAtrex</i>	15 14 5
AUTHORITY ASSIST	sulfentrazone imazethapyr	<i>Spartan</i> <i>Pursuit</i>	14 2
AUTHORITY ELITE	sulfentrazone s-metolachlor	<i>Spartan</i> <i>Dual Magnum</i>	14 15
AUTHORITY FIRST	sulfentrazone cloransulam	<i>Spartan</i> <i>FirstRate</i>	14 2
AUTHORITY MTZ	sulfentrazone metribuzin	<i>Spartan</i> <i>Sencor</i>	14 5
AUTHORITY XL (Authority Maxx)	sulfentrazone chlormuron	<i>Spartan</i> <i>Classic</i>	14 2
AUTUMN SUPER	iodosulfuron thiencarbazone	<i>Autumn</i> ----	2 2
AXIAL STAR	pinoxaden fluroxypyr	<i>Axial XL</i> <i>Starane</i>	1 4
BASIS BLEND	rimsulfuron thifensulfuron	<i>Resolve</i> <i>Harmony</i>	2 2
BETAMIX	desmedipham phenmedipham	<i>Betenex</i> ----	5 5
BICEP II MAGNUM (Bicep Lite II Magnum)	s-metolachlor atrazine	<i>Dual II Magnum</i> <i>AAtrex</i>	15 5
BOUNDARY	s-metolachlor metribuzin	<i>Dual Magnum</i> <i>Sencor</i>	15 5
BREAKFREE ATZ (Breakfree ATZ Lite)	acetochlor atrazine	<i>Breakfree</i> <i>AAtrex</i>	15 5
BROADAXE	s-metolachlor sulfentrazone	<i>Dual Magnum</i> <i>Spartan</i>	15 14
BROADHEAD	carfentrazone quinclorac	<i>Aim</i> <i>Facet</i>	14 4
BRONATE	bromoxynil MCPA	<i>Buctril</i> <i>MCPA</i>	6 4
BULLET	alachlor atrazine	<i>Micro-Tech</i> <i>AAtrex</i>	15 5
CALLISTO XTRA	mesotrione atrazine	<i>Callisto</i> <i>AAtrex</i>	27 5
CANOPY	chlormuron metribuzin	<i>Classic</i> <i>Sencor</i>	2 5
CANOPY EX	chlormuron tribenuron	<i>Classic</i> <i>Express</i>	2 2
CAPRENO	thiencarbazone tembotrione	---- <i>Laudis</i>	2 27
CINCH ATZ (Cinch ATZ Lite)	s-metolachlor atrazine	<i>Dual II Magnum</i> <i>AAtrex</i>	15 5
CLEARPATH	quinclorac imazethapyr	<i>Facet</i> <i>Newpath</i>	4 2
CORVUS	thiencarbazone isoxaflutole	---- <i>Balance Flexx</i>	2 27
CURTAIL	clopyralid 2,4-D	<i>Stinger</i> <i>2,4-D</i>	4 4
CURTAIL M	clopyralid MCPA	<i>Stinger</i> <i>MCPA</i>	4 4
DEGREE XTRA	acetochlor atrazine	<i>Degree</i> <i>AAtrex</i>	15 5
ENLITE	chlormuron thifensulfuron flumioxazin	<i>Classic</i> <i>Harmony</i> <i>Valor</i>	2 2 14
ENVIVE	chlormuron thifensulfuron flumioxazin	<i>Classic</i> <i>Harmony</i> <i>Valor</i>	2 2 14
EXPERT	s-metolachlor atrazine glyphosate	<i>Dual Magnum</i> <i>AAtrex</i> <i>glyphosate</i>	15 5 9
EXTREME	imazethapyr glyphosate acetochlor	<i>Pursuit</i> <i>glyphosate</i> <i>Harness</i>	2 9 15
FIELD MASTER	atrazine glyphosate	<i>AAtrex</i> <i>glyphosate</i>	5 9
FIERCE	flumioxazin pyroxasulfone	<i>Valor</i> <i>Zidua</i>	14 15
FIERCE XLT*	flumioxazin pyroxasulfone chlormuron	<i>Valor</i> <i>Zidua</i> <i>Classic</i>	14 15 2
FINESSE	chlorsulfuron metalsulfuron	<i>Glean</i> <i>Ally</i>	2 2
FINESSE GRASS AND BROADLEAF	chlorsulfuron flucarbazone	<i>Glean</i> <i>Everest</i>	2 2
FLEXSTAR GT	fomesafen glyphosate	<i>Flexstar</i> <i>glyphosate</i>	14 9
FOXFIRE	fenoxaprop pinoxaden	<i>Tecoma</i> <i>Axial XL</i>	1 1
FULTIME	acetochlor atrazine	<i>TopNotch</i> <i>AAtrex</i>	15 5
FUSION	fluaizifop fenoxaprop	<i>Fusilade DX</i> <i>Puma</i>	1 1
GANGSTER	flumioxazin cloransulam	<i>Valor</i> <i>FirstRate</i>	14 2
GOLDSKY	pyroxasulfone florasulam	<i>PowerFlex HL</i> ----	2 2
GUARDSMAN MAX (G-Max Lite)	fluroxypyr dimethenamid-P atrazine	<i>Starane</i> <i>Outlook</i> <i>AAtrex</i>	4 15 5
HALEX GT	s-metolachlor mesotrione glyphosate	<i>Dual Magnum</i> <i>Callisto</i> <i>glyphosate</i>	15 27 9
HARNESS XTRA	acetochlor atrazine	<i>Harness</i> <i>AAtrex</i>	15 5
HORNET	clopyralid flumetsulam	<i>Stinger</i> <i>Python</i>	4 2
HUSKIE	pyrasulfotole bromoxynil	---- <i>Buctril</i>	27 6
HUSKIE COMPLETE	pyrasulfotole bromoxynil thiencarbazone	---- <i>Buctril</i> ----	27 6 2
INSTIGATE	rimsulfuron mesotrione	<i>Resolve, Matrix</i> <i>Callisto</i>	2 27
KEYSTONE (Keystone LA)	acetochlor atrazine	<i>Surpass</i> <i>AAtrex</i>	15 5
LEXAR EZ	mesotrione s-metolachlor	<i>Callisto</i> <i>Dual II Magnum</i>	27 15
LUMAX EZ	atrazine mesotrione	<i>AAtrex</i> <i>Callisto</i>	5 27
MARKSMAN	s-metolachlor dicamba	<i>Dual II Magnum</i> <i>Clarity</i>	15 4
MARVEL	fluthiacet fomesafen	<i>Cadet</i> <i>Flexstar</i>	14 14
NORTHSTAR	primisulfuron dicamba	<i>Beacon</i> <i>Clarity</i>	2 4
OBEY	clomazone quinclorac	<i>Command</i> <i>Facet</i>	13 4
OPTILL	saffluenacil imazethapyr	<i>Sharpen</i> <i>Pursuit</i>	14 2
OPTILL PRO	saffluenacil imazethapyr	<i>Sharpen</i> <i>Pursuit</i>	14 2
ORION	dimethenamid-P florasulam	<i>Outlook</i> ----	15 2
PERMIT PLUS	thifensulfuron halosulfuron	<i>Harmony</i> <i>Permit</i>	2 2
PRIORITY	carfentrazone halosulfuron	<i>Aim</i> <i>Permit</i>	14 2
PREFIX	s-metolachlor fomesafen	<i>Dual Magnum</i> <i>Reflex</i>	15 14
PREQUEL	rimsulfuron isoxaflutole	<i>Resolve</i> <i>Balance Flexx</i>	2 27
PROGRESS	desmedipham phenmedipham	---- ----	5 5
PULSAR	ethofumesate dicamba	<i>Norton</i> <i>Clarity</i>	16 4
PURSUIT PLUS	fluroxypyr imazethapyr	<i>Starane</i> <i>Pursuit</i>	4 2
RAVE	pendimethalin triasulfuron	<i>Prowl</i> <i>Amber</i>	3 2
RAZEL	dicamba flucarbazone	<i>Clarity</i> <i>Everest</i>	4 2
REALM Q	fluroxypyr rimsulfuron	<i>Starane</i> <i>Resolve</i>	4 2
REBELEX	chlormuron penoxsulam	<i>Classic</i> <i>Grasp</i>	2 2
REQUIRE Q	rimsulfuron dicamba	<i>Resolve</i> <i>Clarity</i>	2 4
RESOLVE Q	rimsulfuron thifensulfuron	<i>Resolve</i> <i>Harmony</i>	2 2
RESULT	benfotrol sethoxydim	<i>Basagran</i> <i>Poast</i>	6 1
RIMFIRE MAX	propoxycarbazone mesosulfuron	<i>Olympus</i> <i>Osprey</i>	2 2
SEQUENCE	s-metolachlor glyphosate	<i>Dual Magnum</i> <i>glyphosate</i>	15 9
SHOTGUN	atrazine 2,4-D	<i>AAtrex</i> <i>2,4-D</i>	5 4
SONIC	sulfentrazone cloransulam	<i>Spartan</i> <i>FirstRate</i>	14 2
SPARTAN CHARGE	sulfentrazone carfentrazone	<i>Spartan</i> <i>Aim</i>	14 14
SPIRIT	proflucarbazone primisulfuron	<i>Olympus</i> <i>Beacon</i>	2 2
STARANE FLEX	florasulam fluroxypyr	---- <i>Starane</i>	2 4
STARANE NXT	fluroxypyr bromoxynil	<i>Starane</i> <i>Buctril</i>	4 6
STATUS	diffenozopyr dicamba	---- <i>Clarity</i>	19 4
STEADFAST Q	nicosulfuron rimsulfuron	<i>Accent Q</i> <i>Resolve</i>	2 2
SUPREMACY	fluroxypyr thifensulfuron	<i>Starane</i> <i>Harmony</i>	4 2
SUPREND	tribenuron prometryn	<i>Express</i> <i>Caparol</i>	2 5
STORM	trifloxysulfuron benfotrol	<i>Envoke</i> <i>Basagran</i>	2 6
SURESTART	acifluorfen acetochlor	<i>Ultra Blazer</i> <i>Surpass</i>	14 15
SYNCHRONY	clopyralid flumetsulam	<i>Stinger</i> <i>Python</i>	4 2
TRIPLEFLEX	fluroxypyr florasulam	<i>Starane</i> <i>Python</i>	4 2
TRUMP CARD	2,4-D fluroxypyr	<i>2,4-D</i> <i>Starane</i>	4 4
VALOR XLT	flumioxazin chlormuron	<i>Valor</i> <i>Classic</i>	14 2
VELPAR ALFAMAX	hexazinone diuron	<i>Velpar</i> <i>Karmex</i>	5 7
VERDICT	saffluenacil dimethenamid-P	<i>Sharpen</i> <i>Outlook</i>	14 15
WELD	MCPA fluroxypyr	<i>MCPA</i> <i>Starane</i>	4 4
WIDEMATCH	fluroxypyr fenoxaprop	<i>Starane</i> <i>Tecoma</i>	4 1
WOLVERINE	pyrasulfotole bromoxynil	---- <i>Buctril</i>	27 6
YUKON	dicamba halosulfuron	<i>Banvel</i> <i>Permit</i>	4 2
ZEMAX	mesotrione s-metolachlor	<i>Callisto</i> <i>Dual II Magnum</i>	27 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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