

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 (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	NUMBER OF RESISTANT WEED SPECIES IN U.S.		
	SITE OF ACTION	CHEMICAL FAMILY	PRODUCT EXAMPLES (TRADE NAME*)
1	ACCase INHIBITORS (acetyl CoA carboxylase)	LIPID SYNTHESIS INHIBITORS	
		15	clodinafop <i>Discover NG</i>
			cyhalofop <i>Clincher</i>
			fenoxaprop <i>Ricestar, Tecoma, others</i>
			flazifop <i>Fusilade DX</i>
			quizalofop <i>Assure II, Targa</i>
			clethodim <i>Select Max, others</i>
			sethoxydim <i>Poast, Poast Plus</i>
			pinoxaden <i>Axial XL</i>
2	ALS INHIBITORS (acetolactate synthase)	AMINO ACID SYNTHESIS INHIBITORS	
		Imidazolinone	imazamox <i>Raptor, Beyond, Clearmax</i>
			imazapic <i>Plateau</i>
			imazaquin <i>Scepter</i>
			imazethapyr <i>Pursuit, Newpath</i>
		Pyrimidinylthiobenzoic acid	bispyribac <i>Regiment</i>
			pyrithiobac <i>Staple</i>
			flucarbazone <i>Everest, Pre-Pare, Sierra</i>
		Sulfonylaminocarbonyl-triazolinones	propoxycarbazone <i>Olympus</i>
			thiencarbazone <i>Varro</i>
			bensulfuron <i>Londax</i>
		Sulfonylurea	chlorsulfuron <i>Classic</i>
			chlorsulfuron <i>Glean</i>
			halosulfuron <i>Permit</i>
			iodosulfuron <i>Autumn</i>
			mesosulfuron <i>Osprey</i>
			metsulfuron <i>Ally</i>
			nicosulfuron <i>Accent Q</i>
			orthosulfamuron <i>Strada</i>
			primisulfuron <i>Beacon</i>
			prosulfuron <i>Peak</i>
9	EPSP SYNTHASE INHIBITOR (5-enolpyruvyl-shikimate-3-phosphate)	14	Triazolopyrimidine
			cloransulam <i>FirstRate</i>
			florasulam component of <i>Orion</i>
			flumetsulam <i>Python, Accolade</i>
			penoxsulam <i>Grasp</i>
			pyroxulam <i>PowerFlex HL</i>
4	TIR1 AUXIN RECEPTORS (synthetic auxins)	GROWTH REGULATORS	
		8	Arylpicolinate
			halauxifen component of <i>Quelex*</i>
			Benzoic acid <i>Banvel, Clarity, DiFlexx*, others</i>
			Carboxylic acid
			clopyralid <i>Stinger</i>
			fluroxypyr <i>Starane</i>
			triclopyr <i>Grandstand</i>
			quinclorac <i>Facet, Paramount</i>
			2,4-D <i>2,4-D, others</i>
			Phenoxy MCPA <i>MCPA, others</i>
19	AUXIN TRANSPORT INHIBITOR	0	Semicarbazone diflufenzopyr component of <i>Status</i>
5	PHOTOSYSTEM II INHIBITORS (different binding than 6 & 7)	PHOTOSYNTHESIS INHIBITORS	
		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>
			hexazinone <i>Velpar</i>
			metribuzin <i>Metribuzin, others</i>
			Uracil
6	PHOTOSYSTEM II INHIBITORS (different binding than 5 & 7)	1	Benzothiadiazole bentazon <i>Basagran, others</i>
7	PHOTOSYSTEM II INHIBITORS (different binding than 5 & 6)	9	Nitrile bromoxynil <i>Buctril, others</i>
10	NITROGEN METABOLISM INHIBITOR	1	Amide
			propanil <i>SuperWham</i>
			diuron <i>Direx, Karmex</i>
			fluometuron <i>Cotoran</i>
			linuron <i>Lorox, Linex</i>
12	PHYTOENE DESATURASE (PDS) INHIBITOR	NITROGEN METABOLISM INHIBITOR	
		1	GLUTAMINE SYNTHETASE INHIBITOR
			Organophosphorus
			glufosinate <i>Liberty</i>
13	DOXP SYNTHASE INHIBITOR (1-DEOXY-D-XYULOSE 5-PHOSPHATE)	PIGMENT INHIBITORS	
		1	PHYTOENE DESATURASE (PDS) INHIBITOR
			none recognized
			fluridone <i>Sonar</i>
27	HPPD INHIBITORS	1	ISOXAZOLIDINONE
			clomazone <i>Command</i>
14	PPO 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>
			tembotrione <i>Laudis</i>
			bicyclopyrone component of <i>Acuron*</i>
22	PHOTOSYSTEM I ELECTRON DIVERTER	CELL MEMBRANE DISRUPTERS	
		5	Aryl triazinone
			sulfentrazone <i>Spartan</i>
			carfentrazone <i>Aim</i>
			fluthiacet <i>Cadet</i>
			acifluorfen <i>Ultra Blazer</i>
			Diphenylether
			fomesafen <i>Flexstar, Reflex, others</i>
			lactofen <i>Cobra, Phoenix</i>
			N-phenylphthalimide
			flumiclorac <i>Resource</i>
3	MICROTUBULE INHIBITORS	6	Pyrimidinedione
			flumioxazin <i>Valor, others</i>
			saflufenacil <i>Sharpen</i>
			Bipyridylium
			diquat <i>Reglone</i>
			paraquat <i>Gramoxone SL</i>
8	LIPID SYNTHESIS INHIBITOR (not ACCase)	5	Benzamide
			pronamide <i>Kerb</i>
			ethalfuralin <i>Sonalan</i>
			Dinitroaniline
			pendimethalin <i>Prowl H₂O, others</i>
			trifluralin <i>Treflan, others</i>
15	LONG-CHAIN FATTY ACID INHIBITORS	1	Thiocarbamate
			butylate <i>Sutan +</i>
			cycloate <i>Ro-Neet</i>
			EPTC <i>Eradicane, Eptam</i>
			thiobencarb <i>Bolero</i>
			triallate <i>Far-Go</i>
			Chloroacetamide
			acetochlor <i>Degree, Harness, Surpass NXT, Topnotch, Warrant, others</i>
			alachlor <i>Intro, Micro-Tech</i>
			s-metolachlor <i>Dual Magnum, others</i>
16	SPECIFIC SITE UNKNOWN	0	Oxyacetamide
			dimethenamid-P <i>Outlook</i>
			flufenacet <i>Define</i>
			Pyrazole
			pyroxasulfone <i>Zidua</i>
17	NUCLEIC ACID INHIBITOR	1	UNDEFINED
			Arsenical
			MSMA <i>MSMA</i>

SITE OF ACTION GROUP			
PREMIX	ACTIVE INGREDIENT	TRADE NAME®	
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
AFFORIA	thifensulfuron	Harmony	2
	tribenuron	Express	2
	flumioxazin	Valor	14
AGILITY SG	dicamba	Clarity	4
	thifensulfuron	Harmony	2
ALLY EXTRA	tribenuron	Express	2
	metsulfuron	Ally	2
	pyroxasulfone	Zidua	15
ANTHEM	fluthiacet	Cadet	14
	pyroxasulfone	Zidua	15
ANTHEM ATZ	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 Maxx)	sulfentrazone	Spartan	14
	chlorimuron	Classic	2
AUTUMN SUPER	iodosulfuron	Autumn	2
	thiencarbazone	Varro	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	Metribuzin	5
BRAKE F2	fomesafen	Flexstar	14
	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
CINCH ATZ (Cinch ATZ Lite)	bromoxynil	Buctril	6
	s-metolachlor	Dual II Magnum	15
CLEARPATH	atrazine	AAtrex	5
	quinclorac	Facet	4
COLT + SALVO (Trump Card)	imazethapyr	Newpath	2
	2,4-D	2,4-D	4
COLT + SWORD	fluroxypyr	Starane	4
	MCPA	MCPA	4
CORVUS	fluroxypyr	Starane	4
	thiencarbazone	Varro	2
CURTAIL	isoxaflutole	Balance Flexx	27
	clopyralid	Stinger	4
CURTAIL M	2,4-D	2,4-D	4
	clopyralid	Stinger	4
DEGREE XTRA	MCPA	MCPA	4
	acetochlor	Degree	15
ENLIST DUO	atrazine	AAtrex	5
	2,4-D	2,4-D	4
ENLITE	glyphosate	glyphosate	9
	chlorimuron	Classic	2
ENVIVE	thifensulfuron	Harmony	2
	flumioxazin	Valor	14
EXPERT	chlorimuron	Classic	2
	thifensulfuron	Harmony	2
EXTREME	flumioxazin	Valor	14
	s-metolachlor	Dual Magnum	15
FIELD MASTER	atrazine	AAtrex	5
	glyphosate	glyphosate	9
FIERCE	imazethapyr	Pursuit	2
	glyphosate	glyphosate	9
FIERCE XLT	acetochlor	Harness	15
	atrazine	AAtrex	5
FINESSE	glyphosate	glyphosate	9
	acetochlor	Harness	15
FINESSE GRASS AND BROADLEAF	flumioxazin	Valor	14
	pyroxasulfone	Zidua	15
FLEXSTAR GT	flumioxazin	Valor	14
	pyroxasulfone	Zidua	15
FOXFIRE	chlorimuron	Classic	2
	chloirsulfuron	Glean	2
FULTIME NXT	metribuzin	Ally	2
	chloirsulfuron	Glean	2
FUSION	flucarbazone	Everest	2
	fomesafen	Flexstar	14
GANGSTER	glyphosate	glyphosate	9
	fenoxaprop	Tecoma	1
GOLDSKY	pinoxaden	Axial XL	1
	acetochlor	TopNotch	15
GUARDSMAN MAX (G-Max Lite)	atrazine	AAtrex	5
	fluroxypyr	Starane	4
HALEX GT	fluzifop	Fusilade DX	1
	fenoxaprop	Puma	1
HUSKIE	flumioxazin	Valor	14
	cloransulam	FirstRate	2
HUSKIE COMPLETE	flumioxazin	Valor	14
	cloransulam	FirstRate	2
INSTIGATE	dicamba	Clarity	4
	atrazine	AAtrex	5
KEYSTONE NXT (Keystone LA NXT)	mesotrione	Callisto	27
	acetochlor	Surpass NXT	15
LEADOFF	thifensulfuron	Harmony	2
	mesotrione	Callisto	27
LEXAR EZ	s-metolachlor	Dual II Magnum	15
	atrazine	AAtrex	5
LUMAX EZ	mesotrione	Callisto	27
	s-metolachlor	Dual II Magnum	15
MARKSMAN	atrazine	AAtrex	5
	fluthiacet	Cadet	14
MARVEL	fomesafen	Flexstar	14
	primisulfuron	Beacon	2
NORTHSTAR	dicamba	Clarity	4
	clomazone	Command	13
OBEY	quinclorac	Facet	4
	safufenacil	Sharpen	14
OPTILL	imazethapyr	Pursuit	2
	safufenacil	Sharpen	14
OPTILL PRO	imazethapyr	Pursuit	2
	dimethenamid-P	Outlook	15
ORION	florasulam	-----	2
	MCPA	MCPA	4
PANDOFLEX	thifensulfuron	Harmony	2
	tribenuron	Express	2
PERMIT PLUS	thifensulfuron	Harmony	2
	halosulfuron	Permit	2
PREFIX	s-metolachlor	Dual Magnum	15
	fomesafen	Reflex	14
PREQUEL	rimsulfuron	Resolve	2
	isoxaflutole	Balance	27
PRIORITY	carfentrazone	Aim	14
	halosulfuron	Permit	2
PROGRESS	desmedipham	Betenex	5
	phenmedipham	-----	5
PULSAR	ethofumesate	Norton	16
	dicamba	Clarity	4
QUELEX*	fluroxypyr	Starane	4
	halauzifen	-----	4
RAVE	florasulam	-----	2
	triasulfuron	Amber	2
RAZE	dicamba	Clarity	4
	flucarbazone	Everest	2
REALM Q	fluroxypyr	Starane	4
	fluroxypyr	Starane	4
REBELEX	cyhalofop	Clincher	27
	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
SOLSTICE	mesotrione	Callisto	27
	fluthiacet	Cadet	14
SONIC	sulfentrazone	Spartan	14
	cloransulam	FirstRate	2
SPARTAN CHARGE	sulfentrazone	Spartan	14
	carfentrazone	Aim	14
SPIRIT	prosulfuron	Peak	2
	primisulfuron	Beacon	2
STANZA	clopyralid	Stinger	4
	flumetsulam	Python	2
STARANE FLEX	florasulam	-----	2
	fluroxypyr	Starane	4
STARANE NXT	fluroxypyr	Starane	4
	bromoxynil	Buctril	6
STATUS	diffenozopyr	-----	19
	dicamba	Clarity	4
STEADFAST Q	nicosulfuron	Accent Q	2
	rimsulfuron	Resolve	2
STORM	bentazon	Basagran	6
	acifluorfen	Ultra Blazer	14
SUPREMACY	fluroxypyr	Starane	4
	thifensulfuron	Harmony	2
SUPREND	tribenuron	Express	2
	prometryn	Caparol	5
SURESTART II	triflorysulfuron	Envoke	2
	acetochlor	Surpass	15
SURVEIL	clopyralid	Stinger	4
	flumetsulam	Python	2
SYNCHRONY	flumioxazin	Valor	14
	cloransulam	FirstRate	2
TRIPLEFLEX II	chlorimuron	Classic	2
	thifensulfuron	Harmony	2
TRIVENCE	acetochlor	Harness	15
	clopyralid	Stinger	4
VALOR XLT	flumetsulam	Python	2
	chlorimuron	Classic	2
VARISITO*	flumioxazin	Valor	14
	metribuzin	Metribuzin	5
WELD (FULL DECK)	flumioxazin	Valor	14
	chlorimuron	Classic	2
WIDEMATCH	fluroxypyr	Starane	4
	clopyralid	Stinger	4
WOLVERINE	fluroxypyr	Starane	4
	fenoxaprop	Tecoma	1
YUKON	pyrasulfotole	-----	27
	bromoxynil	Buctril	6
ZEMAX	dicamba	Banvel	7
	halosulfuron	Permit	2
	mesotrione	Callisto	27
	s-metolachlor	Dual II Magnum	15