

# 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) <sup>1</sup>
<b>1</b> ACCASE INHIBITORS (acetyl CoA carboxylase)	15	Aryloxyphenoxypropionate (fops)	clodinafop cyhalofop fenoxaprop fluzifop quizalofop	Discover NG Clincher RiceStar, Tecoma, others Fusilade DX Assure II, Targa
		Cyclohexanedione (dims)	clethodim sethoxydim	Select Max, others Poast, Poast Plus
		Phenylpyrazolin	pinoxaden	Axial XL
<b>2</b> ALS INHIBITORS (acetolactate synthase)	45	Imidazolinone	imazamox imazapic imazaquin imazethapyr	Raptor, Beyond Plateau Scepter Pursuit, Newpath
		Pyrimidinylthiobenzoic acid	bispyribac pyrithiobac	Regiment Staple
		Sulfonylaminocarbonyl-triazolinones	flucarbazone propoxycarbazine thiencarbazon	Everest, Pre-Pare Olympus component of Capreno, others
			bensulfuron chlorimuron chlorsulfuron foramsulfuron halosulfuron iodosulfuron mesosulfuron metsulfuron nicosulfuron	Londax Classic Glean Option Permit Autumn Osprey Ally Accent Q
		Sulfonylurea	orthosulfamuron primisulfuron prosofuron rimsulfuron sulfosulfuron thifensulfuron triasulfuron tribenuron trifloxysulfuron triflusulfuron cloransulam florasulam flumetsulam penoxsulam pyroxulam	Strada Beacon Peak Resolve, Matrix Maverick Harmony Amber Express Envoke UpBeet FirstRate component of Orion Python Grasp PowerFlex HL
<b>9</b> EPSP SYNTHASE INHIBITOR (5-enolpyruvyl-shikimate-3-phosphate)	14	None accepted	glyphosate	Roundup, Touchdown, several
<b>4</b> T1R1 AUXIN RECEPTORS (synthetic auxins)	10	Benzoic acid	dicamba	Banvel, Clarity, others
		Carboxylic acid	clopyralid fluroxypyr	Stinger Starane
		Phenoxy	2,4-D MCPA	2,4-D, others MCPA, others
<b>19</b> AUXIN TRANSPORT INHIBITOR	0	Semicarbazone	diflufenzopyr	component of Status
<b>5</b> PHOTOSYSTEM II INHIBITORS (different binding than 6 & 7)	26	Phenylcarbamate	desmedipham phenmedipham	Betenex component of Betamix
		Triazine	atrazine prometryn simazine	AAtrex, others Caparol Princep
		Triazinone	hexazinone	Velpar
		Uracil	metribuzin terbacil	Sencor, others Sinbar
<b>6</b> PHOTOSYSTEM II INHIBITORS (different binding than 5 & 7)	1	Benzothiadiazole	bentazon	Basagran
		Nitrile	bromoxynil	Buctril, others
		Amide	propanil	SuperWham
<b>7</b> PHOTOSYSTEM II INHIBITORS (different binding than 5 & 6)	8	Urea	diuron fluometuron linuron	Direx, Karmex Cotoran Lorox, Linex
<b>10</b> GLUTAMINE SYNTHETASE INHIBITOR	1	Organophosphorus	glufosinate	Liberty
<b>13</b> DITERPENE SYNTHESIS INHIBITOR	1	Isoxazolidinone	clomazone	Command
<b>27</b> HPPD INHIBITORS	2	Isoxazole	isoxaflutole	Balance Flexx
		Pyrazole	pyrasulfotole	component of Huskie
		Pyrazolone	topramezone	Armezon, Impact
		Triketone	mesotrione tembtrione	Callisto Laudis
<b>14</b> PPO INHIBITORS	2	Aryl triazinone	sulfentrazone carfentrazone fluthiacet acifluorfen	Spartan Aim Cadet Ultra Blazer
		Diphenylether	fomesafen lactofen flumiclorac	Flexstar, Reflex, others Cobra, Phoenix Resource
		N-phenylphthalimide	flumioxazin	Valor
		Pyrimidinedione	saflufenacil	Sharpen
<b>22</b> PHOTOSYSTEM I ELECTRON DIVERTER	5	Bipyridylium	diquat paraquat	Reglone Gramoxone SL
<b>3</b> MICROTUBULE INHIBITORS	6	Amide	pronamide	Kerb
		Dinitroaniline	ethalfuralin pendimethalin trifluralin	Sonalan Prowl H <sub>2</sub> O, others Treflan, others
<b>8</b> LIPID SYNTHESIS INHIBITORS (not ACCase)	5	Thiocarbamate	butylate cycloate EPTC thiobencarb triallate	Sutan + Ro-Neet Eradicane, Eptam Bolero Far-Go
<b>15</b> LONG-CHAIN FATTY ACID INHIBITORS	1	Chloroacetamide	alachlor s-metolachlor dimethenamid-P	Degree, Harness, Surpass, Topnotch, Warrant, others Intro, Micro-Tech Dual Magnum, others Outlook
		Oxyacetamide	flufenacet	Define
		Pyrazole	pyroxasulfone	Zidua
<b>16</b> SPECIFIC SITE UNKNOWN	0	Benzofuran	ethofumesate	Nortron
<b>17</b> NUCLEIC ACID INHIBITORS	1	Arsenical	MSMA	MSMA



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

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