HERBICIDE CLASSIFICATION

Repeated use of herbicides with the same site of action can result in the development of herbicide-resistant weed populations.

Take ACTION
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.

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)	49	Imidazolinone	imazamox	*Raptor, Beyond, Clearmax*
				imazapic	*Plateau*
				imazaquin	*Scepter*
				imazethapyr	*Pursuit, Newpath*
			Pyrimidinylthiobenzoic acid	bispyribac	*Regiment*
				pyrithiobac	*Staple*
			Sulfonylaminocarbonyltriazolinones	flucarbazone	*Everest, Pre-Pare, Sierra*
				propoxycarbazone	*Olympus*
				thiencarbazone	*Varro*
			Sulfonylurea	bensulfuron	*Londax*
				chlorimuron	*Classic*
				chlorsulfuron	*Glean*
				halosulfuron	*Permit*
				iodosulfuron	*Autumn*
				mesosulfuron	*Osprey*
				metsulfuron	*Ally*
				nicosulfuron	*Accent Q, Zest*
				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, Accolade*
				penoxsulam	*Grasp*
				pyroxsulam	*PowerFlex HL*
9	EPSP SYNTHASE INHIBITOR (5-enolpyruvyl-shikimate-3-phosphate)	17	Organophosphorus	glyphosate	*Roundup, several others*
	GROWTH REGULATORS				
4	SYNTHETIC AUXINS (TIR1, AFB5, and unknown auxin receptors)	8	Arylpicolinate	halauxifen	*Elevore*
			Benzoic acid	dicamba	*Banvel, Clarity, DiFlexx, Engenia, FeXapan, XtendiMax, others*
			Carboxylic acid	aminopyralid	*Milestone*
				clopyralid	*Stinger*
				fluroxypyr	*Starane*
				triclopyr	*Remedy Ultra*
				quinclorac	*Facet*
			Phenoxy	2,4-D	*2,4-D, Enlist One, 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	*Metribuzin, others*
			Uracil	terbacil	*Sinbar*
6	PHOTOSYSTEM II INHIBITORS (different binding than 5 & 7)	1	Benzothiadiazole	bentazon	*Basagran, others*
			Nitrile	bromoxynil	*Maestro, Moxy, others*
7	PHOTOSYSTEM II INHIBITORS (different binding than 5 & 6)	9	Amide	propanil	*SuperWham*
			Urea	diuron	*Direx, Karmex*
				fluometuron	*Cotoran*
				linuron	*Lorox, Linex*
	NITROGEN METABOLISM INHIBITOR				
10	GLUTAMINE SYNTHETASE INHIBITOR	1	Organophosphorus	glufosinate	*Liberty, Cheetah, others*
	PIGMENT INHIBITORS				
12	PHYTOENE DESATURASE (PDS) INHIBITOR	1	none recognized	fluridone	*Sonar*
13	DOXP SYNTHASE INHIBITOR (1-DEOXY-D-XYLULOSE 5-PHOSPHATE)	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*
				bicyclopyrone	*component of Acuron*
	CELL MEMBRANE DISRUPTERS				
14	PPO INHIBITORS	4	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, Rowel*
			Pyrimidinedione	saflufenacil	*Sharpen*
22	PHOTOSYSTEM I ELECTRON DIVERTER	5	Bipyridylium	diquat	*Reglone*
				paraquat	*Gramoxone SL*
	SEEDLING ROOT GROWTH INHIBITORS				
3	MICROTUBULE INHIBITORS	6	Benzamide	pronamide	*Kerb*
			Dinitroaniline	ethalfluralin	*Sonalan*
				pendimethalin	*Prowl H2O, 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 NXT, 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*

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: ACTIVE INGREDIENT	COMPONENT: SITE-OF-ACTION GROUP	COMPONENT: TRADE NAME®
ACURON	bicyclopyrone	-----	27
	mesotrione	27	*Callisto*
	atrazine	5	*AAtrex*
	s-metolachlor	15	*Dual II Magnum*
ACURON FLEXI	bicyclopyrone	-----	27
	mesotrione	27	*Callisto*
	s-metolachlor	15	*Dual II Magnum*
AFFINITY BROADSPEC (Affinity Tankmix)	thifensulfuron	2	*Harmony*
	tribenuron	2	*Express*
AFFORIA	thifensulfuron	2	*Harmony*
	tribenuron	2	*Express*
	flumioxazin	14	*Valor*
AGILITY SG	dicamba	4	*Clarity*
	thifensulfuron	2	*Harmony*
	tribenuron	2	*Express*
	metsulfuron	2	*Ally*
ALLY EXTRA	thifensulfuron	2	*Harmony*
	tribenuron	2	*Express*
	metsulfuron	2	*Ally*
ANTHEM ATZ	pyroxasulfone	15	*Zidua*
	flufthiacet	14	*Cadet*
	atrazine	5	*AAtrex*
ANTHEM FLEX	pyroxasulfone	15	*Zidua*
	carfentrazone	14	*Aim*
ANTHEM MAXX	pyroxasulfone	15	*Zidua*
	flufthiacet	14	*Cadet*
ARMEZON PRO	topramezone	27	*Armezon*
	dimethenamid-P	15	*Outlook*
AUTHORITY ASSIST	sulfentrazone	14	*Spartan*
	imazethapyr	2	*Pursuit*
AUTHORITY ELITE	sulfentrazone	14	*Spartan*
	s-metolachlor	15	*Dual Magnum*
AUTHORITY FIRST	sulfentrazone	14	*Spartan*
	cloransulam	2	*FirstRate*
AUTHORITY MTZ	sulfentrazone	14	*Spartan*
	metribuzin	5	*Metribuzin*
AUTHORITY SUPREME*	sulfentrazone	14	*Spartan*
	pyroxasulfone	15	*Zidua*
AUTHORITY XL (Authority Maxx)	sulfentrazone	14	*Spartan*
	chlorimuron	2	*Classic*
AUTUMN SUPER	iodosulfuron	2	*Autumn*
	thiencarbazone	2	*Varro*
	pinoxaden	1	*Axial XL*
AXIAL STAR	fluroxypyr	4	*Starane*
AXIOM	flufenacet	15	*Define*
	metribuzin	5	*Metribuzin*
BASIS BLEND	rimsulfuron	2	*Resolve*
	thifensulfuron	2	*Harmony*
BETAMIX	desmedipham	5	*Betenex*
	phenmedipham	5	-----
BICEP II MAGNUM (Bicep Lite II Magnum)	s-metolachlor	15	*Dual II Magnum*
	atrazine	5	*AAtrex*
BOUNDARY	s-metolachlor	15	*Dual Magnum*
	metribuzin	5	*Metribuzin*
BRAKE F16	fomesafen	14	*Flexstar*
	fluridone	12	*Sonar*
BRAKE FX	flumetsulam	2	*Cotoran*
	fluridone	12	*Sonar*
BREAKFREE NXT ATZ (Breakfree NXT Lite)	acetochlor	15	*Breakfree NXT*
	atrazine	5	*AAtrex*
BROADAXE XC	s-metolachlor	15	*Dual Magnum*
	sulfentrazone	14	*Spartan*
BROADHEAD	carfentrazone	14	*Aim*
	quinclorac	4	*Facet*
BRONATE	bromoxynil	6	*Maestro*
	MCPA	4	*MCPA*
CALLISTO GT	mesotrione	27	*Callisto*
	glyphosate	9	*glyphosate*
CALLISTO XTRA	mesotrione	27	*Callisto*
	atrazine	5	*AAtrex*
CANOPY	chlorimuron	2	*Classic*
	metribuzin	5	*Metribuzin*
CANOPY EX	chlorimuron	2	*Classic*
	tribenuron	2	*Express*
CAPRENO	thiencarbazone	2	*Varro*
	tembotrione	27	*Laudis*
CARNIVORE	MCPA	4	*MCPA*
	clopyralid	4	*Stinger*
	bromoxynil	6	*Maestro*
CHEETAH MAX	glufosinate	10	*Cheetah*
	fomesafen	14	*Reflex*
CINCH ATZ (Cinch ATZ Lite)	s-metolachlor	15	*Dual II Magnum*
	atrazine	5	*AAtrex*
CLEARPATH	quinclorac	4	*Facet*
	imazethapyr	2	*Newpath*
COLT + SALVO (Trump Card)	2,4-D	4	*2,4-D*
	fluroxypyr	4	*Starane*
COLT + SWORD	MCPA	4	*MCPA*
	fluroxypyr	4	*Starane*
CORVUS	thiencarbazone	2	*Varro*
	isoxaflutole	27	*Balance Flexx*
CURTAIL	clopyralid	4	*Stinger*
	2,4-D	4	*2,4-D*
CURTAIL M	clopyralid	4	*Stinger*
	MCPA	4	*MCPA*
DEGREE XTRA	acetochlor	15	*Degree*
	atrazine	5	*AAtrex*
DIFLEXX DUO	dicamba	4	*DiFlexx*
	tembotrione	27	*Laudis*
DILIGENT*	chlorimuron	2	*Classic*
	rimsulfuron	2	*Resolve*
	flumioxazin	14	*Valor*
ENLIST DUO	2,4-D	4	*2,4-D*
	glyphosate	9	*glyphosate*
ENLITE	chlorimuron	2	*Classic*
	thifensulfuron	2	*Harmony*
	flumioxazin	14	*Valor*
ENVIVE	chlorimuron	2	*Classic*
	thifensulfuron	2	*Harmony*
	flumioxazin	14	*Valor*
EXPERT	s-metolachlor	15	*Dual Magnum*
	atrazine	5	*AAtrex*
	glyphosate	9	*glyphosate*
EXTREME	imazethapyr	2	*Pursuit*
	glyphosate	9	*glyphosate*
FIELD MASTER	acetochlor	15	*Harness*
	atrazine	5	*AAtrex*
	glyphosate	9	*glyphosate*
FIERCE	flumioxazin	14	*Valor*
	pyroxasulfone	15	*Zidua*
FIERCE MTZ*	flumioxazin	14	*Valor*
	pyroxasulfone	15	*Zidua*
	metribuzin	5	*Metribuzin*
FIERCE XLT	flumioxazin	14	*Valor*
	pyroxasulfone	15	*Zidua*
	chlorimuron	2	*Classic*
FINESSE	chlorsulfuron	2	*Glean*
	metsulfuron	2	*Ally*
FINESSE GRASS AND BROADLEAF	chlorsulfuron	2	*Glean*
	flucarbazone	2	*Everest*
FLEXSTAR GT	fomesafen	14	*Flexstar*
	glyphosate	9	*glyphosate*
FOXFIRE	fenoxaprop	1	*Tecoma*
	pinoxaden	1	*Axial XL*
FULTIME NXT	acetochlor	15	*TopNotch*
	atrazine	5	*AAtrex*
FUSION	fluazifop	1	*Fusilade DX*
	fenoxaprop	1	*Puma*
GANGSTER	flumioxazin	14	*Valor*
	cloransulam	2	*FirstRate*
GOLDSKY	pyroxsulam	2	*PowerFlex HL*
	florasulam	2	-----
	fluroxypyr	4	*Starane*
GRAZONNEXT HL	aminopyralid	4	*Milestone*
	2,4-D	4	*2,4-D*
HALEX GT	s-metolachlor	15	*Dual Magnum*
	mesotrione	27	*Callisto*
	glyphosate	9	*glyphosate*
HARMONY EXTRA (NIMBLE)	thifensulfuron	2	*Harmony*
	tribenuron	2	*Express*
HARNESS MAX	acetochlor	15	*Harness*
	mesotrione	27	*Callisto*
HARNESS XTRA	acetochlor	15	*Harness*
	atrazine	5	*AAtrex*
HORNET	clopyralid	4	*Stinger*
	flumetsulam	2	*Python*
HUSKIE	pyrasulfotole	-----	27
	bromoxynil	6	*Maestro*
HUSKIE COMPLETE	pyrasulfotole	-----	27
	bromoxynil	6	*Maestro*
	thiencarbazone	2	*Varro*
IMPACT Z*	atrazine	5	*AAtrex*
	topramezone	27	*Impact*
INSTIGATE	rimsulfuron	2	*Resolve, Matrix*
	mesotrione	27	*Callisto*
KEYSTONE NXT (Keystone LA NXT)	acetochlor	15	*Surpass NXT*
	atrazine	5	*AAtrex*
	2,4-D	4	*2,4-D, others*
KOCHIAVORE	fluroxypyr	4	*Starane*
	bromoxynil	6	*Maestro*
LEADOFF	rimsulfuron	2	*Resolve*
	thifensulfuron	2	*Harmony*
LEXAR EZ	mesotrione	27	*Callisto*
	s-metolachlor	15	*Dual II Magnum*
	atrazine	5	*AAtrex*
LUMAX EZ	mesotrione	27	*Callisto*
	s-metolachlor	15	*Dual II Magnum*
	atrazine	5	*AAtrex*
MARVEL	flufthiacet	14	*Cadet*
	fomesafen	14	*Flexstar*
OBEY	clomazone	13	*Command*
	quinclorac	4	*Facet*
OPTILL	saflufenacil	14	*Sharpen*
	imazethapyr	2	*Pursuit*
OPTILL PRO	saflufenacil	14	*Sharpen*
	imazethapyr	2	*Pursuit*
	dimethenamid-P	15	*Outlook*
ORION	florasulam	2	-----
	MCPA	4	*MCPA*
PANOFLEX	thifensulfuron	2	*Harmony*
	tribenuron	2	*Express*
PERMIT PLUS	thifensulfuron	2	*Harmony*
	halosulfuron	2	*Permit*
PREFIX	s-metolachlor	15	*Dual Magnum*
	fomesafen	14	*Reflex*
PREQUEL	rimsulfuron	2	*Resolve*
	isoxaflutole	27	*Balance*
PROGRESS	desmedipham	5	*Betenex*
	phenmedipham	5	-----
	ethofumesate	16	*Nortron*
PULSAR	dicamba	4	*Clarity*
	fluroxypyr	4	*Starane*
QUILEX	halauxifen	4	*Elevore*
	florasulam	2	-----
RAVE	triasulfuron	2	*Amber*
	dicamba	4	*Clarity*
RAZE	flucarbazone	2	*Everest*
	fluroxypyr	4	*Starane*
REALM Q	rimsulfuron	2	*Resolve*
	mesotrione	27	*Callisto*
REBELEX	cyhalofop	1	*Clincher*
	penoxsulam	2	*Grasp*
RESICORE	clopyralid	4	*Stinger*
	acetochlor	15	*Surpass NXT*
	mesotrione	27	*Callisto*
RESOLVE Q	rimsulfuron	2	*Resolve*
	thifensulfuron	2	*Harmony*
REVULIN Q	nicosulfuron	2	*Accent Q*
	mesotrione	27	*Callisto*
RIMFIRE MAX	propoxycarbazone	2	*Olympus*
	mesosulfuron	2	*Osprey*
ROUNDUP XTEND*	dicamba	4	*XtendiMax*
	glyphosate	9	*glyphosate*
ROWEL FX	flumioxazin	14	*Valor*
	chlorimuron	2	*Classic*
SENTRALLAS	thifensulfuron	2	*Harmony*
	fluroxypyr	4	*Starane*
SEQUENCE	s-metolachlor	15	*Dual Magnum*
	glyphosate	9	*glyphosate*
SOLSTICE	mesotrione	27	*Callisto*
	flufthiacet	14	*Cadet*
SUNIC	sulfentrazone	14	*Spartan*
	cloransulam	2	*FirstRate*
SPARTAN CHARGE	sulfentrazone	14	*Spartan*
	carfentrazone	14	*Aim*
STANZA	clopyralid	4	*Stinger*
	flumetsulam	2	*Python*
STARANE FLEX	florasulam	2	-----
	fluroxypyr	4	*Starane*
STARANE NXT	fluroxypyr	4	*Starane*
	bromoxynil	6	*Maestro*
STATUS	diflufenzopyr	17	-----
	dicamba	4	*Clarity*
STEADFAST Q	nicosulfuron	2	*Accent Q*
	rimsulfuron	2	*Resolve*
STORM	bentazon	6	*Basagran*
	acifluorfen	14	*Ultra Blazer*
SUPREMACY	fluroxypyr	4	*Starane*
	thifensulfuron	2	*Harmony*
	tribenuron	2	*Express*
SUPREND	prometryn	5	*Caparol*
	trifloxysulfuron	2	*Envoke*
SURESTART II	acetochlor	15	*Surpass NXT*
	clopyralid	4	*Stinger*
	flumetsulam	2	*Python*
SURVEIL	flumioxazin	14	*Valor*
	cloransulam	2	*FirstRate*
SYNCHRONY	chlorimuron	2	*Classic*
	thifensulfuron	2	*Harmony*
TALINOR	bromoxynil	6	*Maestro*
	bicyclopyrone	-----	27
TRAVALLAS	metsulfuron	2	*Ally*
	thifensulfuron	2	*Harmony*
	fluroxypyr	4	*Starane*
TRIPLEFLEX II	acetochlor	15	*Harness*
	clopyralid	4	*Stinger*
	flumetsulam	2	*Python*
TRIVENCE	chlorimuron	2	*Classic*
	flumioxazin	14	*Valor*
	metribuzin	5	*Metribuzin*
VALOR XLT	flumioxazin	14	*Valor*
	chlorimuron	2	*Classic*
VARISTO	imazamox	2	*Raptor*
	bentazon	6	*Basagran*
VELPAR ALFAMAX	hexazinone	5	*Velpar*
	diuron	2	*Karmex*
VERDICT	saflufenacil	14	*Sharpen*
	dimethenamid-P	15	*Outlook*
WARRANT ULTRA	fomesafen	14	*Reflex*
	acetochlor	15	*Warrant*
WELD (FULL DECK)	MCPA	4	*MCPA*
	fluroxypyr	4	*Starane*
	clopyralid	4	*Stinger*
WIDEMATCH	clopyralid	4	*Stinger*
	fluroxypyr	4	*Starane*
WOLVERINE	fenoxaprop	1	*Tecoma*
	pyrasulfotole	-----	27
	bromoxynil	6	*Maestro*
YUKON	dicamba	4	*Banvel*
	halosulfuron	2	*Permit*
ZEMAX	mesotrione	27	*Callisto*
	s-metolachlor	15	*Dual II Magnum*
	imazethypyr	2	*Pursuit*
	saflufenacil	14	*Sharpen*
ZIDUA PRO	pyroxasulfone	15	*Zidua*

For more information and links to additional resources, visit www.IWillTakeAction.com

TAKE ACTION IS ENDORSED BY THE FOLLOWING ORGANIZATIONS:

*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. This chart contains some Restricted Use Pesticides (RUPs); always consult label prior to use.

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