

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 (MOA) (effect on plant growth)

This chart groups herbicides by their modes and sites of action to assist you in selecting herbicides to...
1 maintain greater diversity in herbicide use and
2 rotate among effective herbicides with different **sites of action** to delay the development of herbicide resistance

SITE-OF-ACTION GROUP ¹	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)	14	Aryloxyphenoxypropionate (traps)	clodinafop <i>Discover NG</i> cyhalofop <i>Cincher</i> fenoxaprop <i>Ricestar HT, others</i> fluzafop <i>Fusilade DX</i> quizalofop <i>Aggressor, Assure II, Targa</i> sethoxydim <i>Select Max, others</i> pinoxaden <i>Axial XL</i>
			Cyclohexanedione (dimer)	sethoxydim <i>Poast, Poast Plus</i> pinoxaden <i>Axial XL</i>
2	ALS INHIBITORS (acetolactate synthase)	53	Imidazolinone	imazamox <i>Raptor, Beyond</i> imazapic <i>Plateau</i> imazapyr <i>Arsenal</i> imazaquin <i>Scepter</i> imazethapyr <i>Pursuit, Newpath</i>
			Pyrimidinyl benzotriazoles	bispyribac <i>Regiment</i> pyrithiobac <i>Staple</i> bensulfuron <i>Londax</i> chlorimuron <i>Classic</i> chlorsulfuron <i>Glean</i> halosulfuron <i>Permit, Sandea</i> iodosulfuron <i>Autumn</i> mesosulfuron <i>Osprey</i> metsulfuron <i>Ally</i> nicosulfuron <i>Accent Q, Zest</i>
9	EPSP SYNTHASE INHIBITOR (5-enolpyruvyl-shikimate-3-phosphate)	17	Sulfonylurea	orthosulfamuron <i>Strada</i> primisulfuron <i>Beacon</i> proprylsulfuron <i>Peak</i> rimsulfuron <i>Matrix, Resolve</i> sulfosulfuron <i>Outright</i> thifensulfuron <i>Harmony</i> triasulfuron <i>Amber</i> tribenuron <i>Express</i> triflousulfuron <i>Envoke</i> trifluralin <i>UpBeet</i>
			Triazolones	flucarbazone <i>Everest, Pre-Paré</i> propoxycarbazone <i>Olympus</i> thiencarbazone <i>Varro</i> clorasulam <i>FirstRate</i>
9	EPSP SYNTHASE INHIBITOR (5-enolpyruvyl-shikimate-3-phosphate)	17	Triazolopyrimidine - Type 1	florasulam <i>component of Orion, Duexel, Starane Flex</i> flumetsulam <i>Python</i>
			Triazolopyrimidine - Type 2	penoxsulam <i>Grasp</i> pyrasulfam <i>PowerFlex HL</i>
9	EPSP SYNTHASE INHIBITOR (5-enolpyruvyl-shikimate-3-phosphate)	17	Glycine	glyphosate <i>Roundup, several others</i>

GROWTH REGULATORS				
4	SYNTHETIC AUXINS (TIR1, AFB1-5 and unknown auxin receptor)	10	6-Arylpicolinates	florpyrauxifen <i>Loyant</i> halauxifen <i>Elevere</i>
			Benzotriazole	dicamba <i>Banvel, Clarity, DiFlex, Engenia, XtendiMax, others</i>
19	AUXIN TRANSPORT INHIBITOR	0	Phenoxy carboxylate	2,4-D <i>2,4-D, Enlist One, others</i> MCPA <i>MCPA, others</i>
			Pyridine carboxylate	aminopyralid <i>Milestone</i> clopyralid <i>Stinger HL</i>
19	AUXIN TRANSPORT INHIBITOR	0	Pyridyloxy carboxylate	fluroxypyr <i>Starane Ultra</i> triclopyr <i>Garlon, Remedy Ultra</i>
			Quinoline carboxylate	quinclorac <i>Facet</i>
19	AUXIN TRANSPORT INHIBITOR	0	Aryl carboxylate	diffenozopyr <i>component of Status</i>

PHOTOSYNTHESIS INHIBITORS				
5	PHOTOSYSTEM II INHIBITORS (D1 Serine 264 binders and non-histidine 215 binders)	28	Amide	propanil <i>SuperWham</i> atrazine <i>AAtrex, others</i> prometon <i>Pramitol</i> prometryn <i>Caparol</i> simazine <i>Princep</i>
			Triazine	hexazinone <i>Velpar</i> metribuzin <i>Metribuzin, others</i> terbacil <i>Sinbar</i>
6	PHOTOSYSTEM II INHIBITORS (D1 Histidine 215 binders)	1	Uracil	diuron <i>Dirax, Karmex</i> fluometuron <i>Cotoran</i> linuron <i>Lorox, Linex</i> tebuthiuron <i>Spike</i>
			Urea	benzothiadiazinone <i>Bentazon</i> bromoxynil <i>Maestro, Mox, others</i> phenyl pyridazine <i>Tough</i>

NITROGEN METABOLISM INHIBITOR				
10	GLUTAMINE SYNTHETASE INHIBITOR	3	Phosphinic acid	glufosinate <i>Liberty, Rely, others</i>

PIGMENT INHIBITORS				
12	PHYTOENE DESATURASE (PDS) INHIBITORS	1	Diphenyl heterocycle	fluridone <i>Brake, Sonar</i>
13	DOXP SYNTHASE INHIBITOR (1-DEOXY-D-XYLULOSE 5-PHOSPHATE)	2	N-Phenyl heterocycle	norflurazon <i>Solican</i>
			Phenyl ether	diflufenican <i>-----</i>
27	HPPD INHIBITORS	3	Isoxazolidinone	clomazone <i>Command 3ME</i>
			Isoxazole	isoxaflutole <i>Alite Z7, Balance Flex</i> pyrasulfotole <i>component of Huskie</i>
27	HPPD INHIBITORS	3	Pyrazole	topramezone <i>Armezon, Impact</i> tolpyralate <i>Shieldex</i>
			Triketone	bicyclopyrone <i>Optogen</i> mesotrione <i>Callisto</i> tembotrione <i>Laudis</i>

CELL MEMBRANE DISRUPTERS				
14	PPD INHIBITORS	5	Diphenyl ether	acifluorfen <i>Ultra Blazer</i> fomesafen <i>Flexstar, Reflex, others</i> lactofen <i>Cobra, Phoenix</i> flumiclorac <i>Resource</i> flumioxazin <i>Valor, Chateau, others</i>
			N-Phenyl imide	fluthiacet <i>Cadet</i> saflufenacil <i>Sharpen</i> tisafenacil <i>Reviton, Gamma</i> carfentrazone <i>Aim</i> sulfentrazone <i>Spartan</i>
22	PHOTOSYSTEM I ELECTRON DIVERTER	6	Pyridinium	diquat <i>Reglone</i> paraquat <i>Gramoxone SL</i>

SEEDLING ROOT GROWTH INHIBITORS				
3	MICROTUBULE ASSEMBLY INHIBITORS	6	Benzamide	pronamide <i>Kerb</i> ethalfuralin <i>Sonalan</i> pendimethalin <i>Prowl H2O, others</i> trifluralin <i>Treflan, others</i>
			Pyridine	dithiopyr <i>Dimension</i>

SEEDLING SHOOT GROWTH INHIBITORS				
15	VERY LONG-CHAIN FATTY ACID SYNTHESIS INHIBITORS	8	Benzofuran	ethofumesate <i>Nortron</i> acetochlor <i>Harness, Surpass, Warrant, others</i>
			α-Chloroacetamide	dimethenamid-P <i>Outlook</i> s-metolachlor <i>Dual Magnum, others</i>
15	VERY LONG-CHAIN FATTY ACID SYNTHESIS INHIBITORS	8	Isoxazoline	pyrasulfone <i>Zidua</i>
			α-Diacycetamide	flufenacet <i>Define</i> cycloate <i>Ro-Neet</i>
15	VERY LONG-CHAIN FATTY ACID SYNTHESIS INHIBITORS	8	Thiocarbamate	EPTC <i>Eradicane, Eptam</i> thiobencarb <i>Bolero</i> triallate <i>Far-Go</i>
			Aylkylazine	indaziflam <i>Esplanade, Rezilon</i>
29	CELLULOSE BIOSYNTHESIS INHIBITORS	1	Benzamide	isoxaben <i>Gallery, Trellis</i>

UNDEFINED				
0	UNKNOWN	1	Amide	napropamide <i>Devrinol</i>
0	UNKNOWN	1	Arsenical	MSMA <i>MSMA</i>

¹Site of action group numbers follow the revised 2024 Herbicide Resistance Action Committee (HRAC) classification.

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
	ACTIVE INGREDIENT	TRADE NAME	
ACURON	bicyclopyrone	<i>Optogen</i>	27
	mesotrione	<i>Callisto</i>	27
	atrazine	<i>AAtrex</i>	5
	s-metolachlor	<i>Dual II Magnum</i>	15
	bicyclopyrone	<i>Optogen</i>	27
ACURON FLEXI	mesotrione	<i>Callisto</i>	27
	s-metolachlor	<i>Dual II Magnum</i>	15
	bicyclopyrone	<i>Optogen</i>	27
	mesotrione	<i>Callisto</i>	27
	s-metolachlor	<i>Dual Magnum</i>	15
ACURON GT	glyphosate	<i>glyphosate</i>	9
	thifensulfuron	<i>Harmony</i>	2
AFFINITY BROADSPEC (Affinity TankMix)	thifensulfuron	<i>Harmony</i>	2
	tribenuron	<i>Express</i>	2
	thifensulfuron	<i>Harmony</i>	2
AFFORIA	tribenuron	<i>Express</i>	2
	flumioxazin	<i>Valor</i>	14
	thifensulfuron	<i>Harmony</i>	2
ALLY EXTRA	tribenuron	<i>Express</i>	2
	metsulfuron	<i>Ally</i>	2
ANTHEM FLEX	pyroxasulfone	<i>Zidua</i>	15
	carfentrazone	<i>Aim</i>	14
ANTHEM MAXX	pyroxasulfone	<i>Zidua</i>	15
	fluthiacet	<i>Cadet</i>	14
ARMEZON PRO	topramezone	<i>Armezon</i>	27
	dimethenamid-P	<i>Outlook</i>	15
AUTHORITY ASSIST	sulfentrazone	<i>Spartan</i>	14
	imazethapyr	<i>Pursuit</i>	2
AUTHORITY EDGE	sulfentrazone	<i>Spartan</i>	14
	pyroxasulfone	<i>Zidua</i>	15
AUTHORITY FIRST	sulfentrazone	<i>Spartan</i>	14
	clorasulam	<i>FirstRate</i>	2
AUTHORITY SUPREME	sulfentrazone	<i>Spartan</i>	14
	pyroxasulfone	<i>Zidua</i>	15
AUTHORITY XL	sulfentrazone	<i>Spartan</i>	14
	chlorimuron	<i>Classic</i>	2
AUTUMN SUPER	iodosulfuron	<i>Autumn</i>	2
	thiencarbazone	<i>Varro</i>	2
AXIAL BOLD	pinoxaden	<i>Axial XL</i>	1
	fenoxaprop	<i>Ricestar</i>	1
AXIAL STAR	pinoxaden	<i>Axial XL</i>	1
	fluroxypyr	<i>Starane</i>	4
BASIS BLEND	rimsulfuron	<i>Resolve</i>	2
	thifensulfuron	<i>Harmony</i>	2
BICEP II MAGNUM (Bicep Lite II Magnum)	s-metolachlor	<i>Dual II Magnum</i>	15
	atrazine	<i>AAtrex</i>	5
BOUNDARY	s-metolachlor	<i>Dual Magnum</i>	15
	metribuzin	<i>Metribuzin</i>	5
BROADAXE XC	s-metolachlor	<i>Dual Magnum</i>	15
	sulfentrazone	<i>Spartan 4F</i>	14
BRONATE ADVANCED	bromoxynil	<i>Maestro</i>	6
	MCPA	<i>MCPA</i>	4
CALIBRA	s-metolachlor	<i>Dual II Magnum</i>	15
	mesotrione	<i>Callisto</i>	27
CALLISTO GT	mesotrione	<i>Callisto</i>	27
	glyphosate	<i>glyphosate</i>	9
CALLISTO XTRA	mesotrione	<i>Callisto</i>	27
	atrazine	<i>AAtrex</i>	5
CAPRENO	thiencarbazone	<i>Varro</i>	2
	tembotrione	<i>Laudis</i>	27
CARNIVORE	MCPA	<i>MCPA</i>	4
	fluroxypyr	<i>Starane</i>	4
CHEETAH MAX	bromoxynil	<i>Maestro</i>	6
	glufosinate	<i>Liberty</i>	10
CLEARPATH	fomesafen	<i>Reflex</i>	14
	quinclorac	<i>Facet</i>	4
COLT AS	imazethapyr	<i>Newpath</i>	2
	clopyralid	<i>Stinger</i>	4
COLT + SALVO	fluroxypyr	<i>Starane</i>	4
	2,4-D	<i>2,4-D</i>	4
COLT + SWORD	fluroxypyr	<i>Starane</i>	4
	MCPA	<i>MCPA</i>	4
CORVUS	fluroxypyr	<i>Starane</i>	4
	thiencarbazone	<i>Varro</i>	2
COYOTE	isoxaflutole	<i>Balance Flex</i>	27
	s-metolachlor	<i>Dual II Magnum</i>	15
CRUSHER	mesotrione	<i>Callisto</i>	27
	rimsulfuron	<i>Resolve</i>	2
CURTAIL	thifensulfuron	<i>Harmony</i>	2
	clopyralid	<i>Stinger</i>	4
CURTAIL M	2,4-D	<i>2,4-D</i>	4
	clopyralid	<i>Stinger</i>	4
DEGREE XTRA	MCPA	<i>MCPA</i>	4
	acetochlor	<i>Degree</i>	15
DIFLEX DUO	atrazine	<i>AAtrex</i>	5
	dicamba	<i>DiFlex</i>	4
DIMETRIC CHARGED	tembotrione	<i>Laudis</i>	27
	metribuzin	<i>Metribuzin</i>	5
ENLIST DUO	flumioxazin	<i>Valor</i>	14
	2,4-D	<i>2,4-D</i>	4
ENLITE	glyphosate	<i>glyphosate</i>	9
	chlorimuron	<i>Classic</i>	2
ENLVUE	thifensulfuron	<i>Harmony</i>	2
	flumioxazin	<i>Valor</i>	14
EXTREME	imazethapyr	<i>Pursuit</i>	2
	glyphosate	<i>glyphosate</i>	9
FIERCE EZ	flumioxazin	<i>Valor</i>	14
	pyroxasulfone	<i>Zidua</i>	15
FIERCE MTZ	flumioxazin	<i>Valor</i>	14
	pyroxasulfone	<i>Zidua</i>	15
FIERCE XLT	metribuzin	<i>Metribuzin</i>	5
	flumioxazin	<i>Valor</i>	14
FINESSE	pyroxasulfone	<i>Zidua</i>	15
	chlorimuron	<i>Classic</i>	2
FIRSTSHOT	thifensulfuron	<i>Harmony</i>	2
	tribenuron	<i>Express</i>	2
FLEXSTAR GT	fomesafen	<i>Flexstar</i>	14
	glyphosate	<i>glyphosate</i>	9
FULTIME NXT	acetochlor	<i>TopNotch</i>	15
	atrazine	<i>AAtrex</i>	5
FUSION	fluzafop	<i>Fusilade DX</i>	1
	fenoxaprop	<i>Puma</i>	1
GOLDSKY	pyrasulfam	<i>PowerFlex HL</i>	2
	florasulam	<i>-----</i>	2
GRAZONNEXT HL	fluroxypyr	<i>Starane</i>	4
	aminopyralid	<i>Milestone</i>	4
HALEX GT	2,4-D	<i>2,4-D</i>	4
	s-metolachlor	<i>Dual Magnum</i>	15
HARMONY EXTRA	mesotrione	<i>Callisto</i>	27
	glyphosate	<i>glyphosate</i>	9
HARNESSE MAX	thifensulfuron	<i>Harmony</i>	2
	tribenuron	<i>Express</i>	2
HARNESSE XTRA	acetochlor	<i>Harness</i>	15
	mesotrione	<i>Callisto</i>	27
HORNET	acetochlor	<i>Harness</i>	15
	atrazine	<i>AAtrex</i>	5
HUSKIE	clopyralid	<i>Stinger</i>	4
	flumetsulam	<i>Python</i>	2
HUSKIE COMPLETE	pyrasulfotole	<i>-----</i>	27
	bromoxynil	<i>Maestro</i>	6
HUSKIE FX	pyrasulfotole	<i>-----</i>	27
	bromoxynil	<i>Maestro</i>	6
IMPACT CORE	fluroxypyr	<i>Starane Ultra</i>	4
	acetochlor	<i>Harness</i>	15
IMPACTZ	topramezone	<i>Impact</i>	27
	atrazine	<i>AAtrex</i>	5
INTERMOC	topramezone	<i>Impact</i>	27
	glufosinate	<i>Liberty</i>	10
KATAGON	s-metolachlor	<i>Dual Magnum</i>	15
	nicosulfuron	<i>Accent Q</i>	2
KEYSTONE NXT (Keystone LA NXT)	tolpyralate	<i>Shieldex</i>	27
	acetochlor	<i>Surpass NXT</i>	15
KOCIAVORE	atrazine	<i>AAtrex</i>	5
	2,4-D	<i>2,4-D, others</i>	4
KYBER	fluroxypyr	<i>Starane</i>	4
	s-metolachlor	<i>Dual II Magnum</i>	15
KYRO	flumioxazin	<i>Valor</i>	14
	pyroxasulfone	<i>Zidua</i>	15
LEXAR EZ	metribuzin	<i>Metribuzin</i>	5
	acetochlor	<i>Surpass NXT</i>	15
LUMAX EZ	topramezone	<i>Impact</i>	27
	clopyralid	<i>Stinger</i>	4
MARVEL	mesotrione	<i>Callisto</i>	27
	s-metolachlor	<i>Dual II Magnum</i>	15
MAVERICK	atrazine	<i>AAtrex</i>	5
	fluthiacet	<i>Cadet</i>	14
NOVIKID	fomesafen	<i>Flexstar</i>	14
	pyroxasulfone	<i>Zidua</i>	15
OBEY	clopyralid	<i>Stinger</i>	4
	mesotrione	<i>Callisto</i>	27
OPENSKY	fluroxypyr	<i>Starane Ultra</i>	4
	pyrasulfam	<i>PowerFlex HL</i>	2
ORION	florasulam	<i>-----</i>	2
	MCPA		