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 (MOA) *(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[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 (fops)	clodinafop	*Discover NG*
				cyhalofop	*Clincher*
				fenoxaprop	*Ricestar HT, others*
				fluazifop	*Fusilade DX*
				quizalofop	*Aggressor, Assure II, Targa*
			Cyclohexanedione (dims)	clethodim	*Select Max, others*
				sethoxydim	*Poast, Poast Plus*
			Phenylpyrazoline	pinoxaden	*Axial XL*
AMINO ACID SYNTHESIS INHIBITORS					
2	ALS INHIBITORS (acetolactate synthase)	53	Imidazolinone	imazamox	*Raptor, Beyond, Clearmax*
				imazapic	*Plateau*
				imazapyr	*Arsenal*
				imazaquin	*Scepter*
				imazethapyr	*Pursuit, Newpath*
			Pyrimidinyl benzoates	bispyribac	*Regiment*
				pyrithiobac	*Staple*
			Sulfonylurea	bensulfuron	*Londax*
				chlorimuron	*Classic*
				chlorsulfuron	*Glean*
				halosulfuron	*Permit, Sandea*
				iodosulfuron	*Autumn*
				mesosulfuron	*Osprey*
				metsulfuron	*Ally*
				nicosulfuron	*Accent Q, Zest*
				orthosulfamuron	*Strada*
				primisulfuron	*Beacon*
				prosulfuron	*Peak*
				rimsulfuron	*Matrix, Resolve*
				sulfosulfuron	*Outrider*
				thifensulfuron	*Harmony*
				triasulfuron	*Amber*
				tribenuron	*Express*
				trifloxysulfuron	*Envoke*
				trifloxsulfuron	*UpBeet*
			Triazolinones	flucarbazone	*Everest, Pre-Pare, Sierra*
				propoxycarbazone	*Olympus*
				thiencarbazone	*Varro*
			Triazolopyrimidine - Type 1	cloransulam	*FirstRate*
				florasulam	*component of Orion, Quelex, Starane Flex*
				flumetsulam	*Python, Accolade*
			Triazolopyrimidine - Type 2	penoxsulam	*Grasp*
				pyroxsulam	*PowerFlex HL*
9	EPSP SYNTHASE INHIBITOR (5-enolpyruvyl-shikimate-3-phosphate)	17	Glycine	glyphosate	*Roundup, several others*
GROWTH REGULATORS					
4	SYNTHETIC AUXINS (TIR1, AFB5 and unknown auxin receptor)	10	Benzoic acid	dicamba	*Banvel, Clarity, DiFlexx, Engenia, XtendiMax, others*
			Phenoxy	2,4-D	*2,4-D, Enlist One, others*
				MCPA	*MCPA, others*
			Pyridine carboxylate	aminopyralid	*Milestone*
				clopyralid	*Stinger HL*
				florpyrauxifen	*Loyant*
				fluroxypyr	*Starane Ultra*
				halauxifen	*Elevore*
				triclopyr	*Garlon, Remedy Ultra*
			Quinoline carboxylate	quinclorac	*Facet*
19	AUXIN TRANSPORT INHIBITOR	0	Aryl carboxylate	diflufenzopyr	*component of Status*
PHOTOSYNTHESIS INHIBITORS					
5	PHOTOSYSTEM II INHIBITORS (Serine 264 binders)	28	Amide	propanil	*SuperWham*
			Phenylcarbamate	desmedipham	*Betenex*
				phenmedipham	*component of Betamix*
			Triazine	atrazine	*AAtrex, others*
				prometon	*Pramitol*
				prometryn	*Caparol*
				simazine	*Princep*
			Triazinone	hexazinone	*Velpar*
				metribuzin	*Metribuzin, others*
			Uracil	terbacil	*Sinbar*
			Urea	diuron	*Direx, Karmex*
				fluometuron	*Cotoran*
				linuron	*Lorox, Linex*
				tebuthiuron	*Spike*
6	PHOTOSYSTEM II INHIBITORS (Histidine 215 binders)	1	Benzothiadiazinone	bentazon	*Basagran, others*
			Nitrile	bromoxynil	*Maestro, Moxy, others*
			Phenyl pyridazine	pyridate	*Tough*
NITROGEN METABOLISM INHIBITOR					
10	GLUTAMINE SYNTHETASE INHIBITOR	1	Phosphinic acid	glufosinate	*Liberty, Rely, Novenda, others*
PIGMENT INHIBITORS					
12	PHYTOENE DESATURASE (PDS) INHIBITOR	1	Diphenyl heterocycle	fluridone	*Sonar*
			N-Phenyl heterocycle	norflurazon	*Solicam*
13	DOXP SYNTHASE INHIBITOR (1-DEOXY-D-XYLULOSE 5-PHOSPHATE)	2	Isoxazolidinone	clomazone	*Command 3ME*
27	HPPD INHIBITORS	2	Isoxazole	isoxaflutole	*Alite 77, Balance Flexx*
			Pyrazole	pyrasulfotole	*component of Huskie*
				topramezone	*Armezon, Impact*
				tolpyralate	*Shieldex*
			Triketone	mesotrione	*Callisto*
				tembotrione	*Laudis*
				bicyclopyrone	*component of Acuron*
CELL MEMBRANE DISRUPTERS					
14	PPO INHIBITORS	4	Diphenylether	acifluorfen	*Ultra Blazer*
				fomesafen	*Flexstar, Reflex, others*
				lactofen	*Cobra, Phoenix*
			N-Phenyl imide	flumiclorac	*Resource*
				flumioxazin	*Valor, Chateau, others*
				saflufenacil	*Sharpen*
				tiafenacil	*Revitan, Gamma*
			N-Phenyl triazolinone	carfentrazone	*Aim*
				sulfentrazone	*Spartan*
22	PHOTOSYSTEM I ELECTRON DIVERTER	6	Pyridinium	diquat	*Reglone*
				paraquat	*Gramoxone SL*
SEEDLING ROOT GROWTH INHIBITORS					
3	MICROTUBULE ASSEMBLY INHIBITORS	6	Benzamide	pronamide	*Kerb*
			Dinitroaniline	ethalfluralin	*Sonalan*
				pendimethalin	*Prowl H2O, others*
				trifluralin	*Treflan, others*
			Pyridine	dithiopyr	*Dimension*
SEEDLING SHOOT GROWTH INHIBITORS					
15	VERY LONG-CHAIN FATTY ACID SYNTHESIS INHIBITORS	8	Benzofurane	ethofumesate	*Nortron*
			α-Chloroacetamide	acetochlor	*Harness, Surpass, Warrant, others*
				dimethenamid-P	*Outlook*
				s-metolachlor	*Dual Magnum, others*
			Isoxazoline	pyrasoxsulfone	*Zidua*
			α-Oxyacetamide	flufenacet	*Define*
			Thiocarbamate	butylate	*Sutan +*
				cycloate	*Ro-Neet*
				EPTC	*Eradicane, Eptam*
				thiobencarb	*Bolero*
				triallate	*Far-Go*
29	CELLULOSE BIOSYNTHESIS INHIBITOR	0	Aylkylazine	indaziflam	*Esplanade, Rezilon*
			Benzamide	isoxaben	*Gallery, Trellis*
UNDEFINED					
0	UNKNOWN		Amide	napropamide	*Devrinol*
			Arsenical	MSMA	*MSMA*

[1]Site-of-action group numbers follow the revised 2020 Herbicide Resistance Action Committee (HRAC) classification.

For more information and links to additional resources, visit 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. Always consult label prior to use.

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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: TRADE NAME	SITE-OF-ACTION GROUP
ACURON	bicyclopyrone	------	27
	mesotrione	*Callisto*	27
	atrazine	*AAtrex*	5
	s-metolachlor	*Dual II Magnum*	15
ACURON FLEXI	bicyclopyrone	------	27
	mesotrione	*Callisto*	27
	s-metolachlor	*Dual II Magnum*	15
ACURON GT	bicyclopyrone	------	27
	mesotrione	*Callisto*	27
	s-metolachlor	*Dual II Magnum*	15
	glyphosate	*glyphosate*	9
AFFINITY BROADSPEC [Affinity TankMix]	thifensulfuron	*Harmony*	2
	tribenuron	*Express*	2
	thifensulfuron	*Harmony*	2
AFFORIA	tribenuron	*Express*	2
	flumioxazin	*Valor*	14
AGILITY SG	dicamba	*Clarity*	4
	thifensulfuron	*Harmony*	2
	tribenuron	*Express*	2
	metsulfuron	*Ally*	2
ALLY EXTRA	thifensulfuron	*Harmony*	2
	tribenuron	*Express*	2
	metsulfuron	*Ally*	2
ANTHEM FLEX	pyroxasulfone	*Zidua*	15
	carfentrazone	*Aim*	14
ANTHEM MAXX	pyroxasulfone	*Zidua*	15
	flufenacet	*Cadet*	14
ARMEZON PRO	topramezone	*Armezon*	27
	dimethenamid-P	*Outlook*	15
AUTHORITY ASSIST	sulfentrazone	*Spartan*	14
	imazethapyr	*Pursuit*	2
AUTHORITY EDGE	sulfentrazone	*Spartan*	14
	pyroxasulfone	*Zidua*	15
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 SUPREME	sulfentrazone	*Spartan*	14
	pyroxasulfone	*Zidua*	15
AUTHORITY XL (Authority Maxx)	sulfentrazone	*Spartan*	14
	chlorimuron	*Classic*	2
AUTUMN SUPER	iodosulfuron	*Autumn*	2
	thiencarbazone	*Varro*	2
AXIAL BOLD	pinoxaden	*Axial XL*	1
	fenoxaprop	*Ricestar*	1
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 F16	fomesafen	*Flexstar*	14
	fluridone	*Sonar*	12
BRAKE FX	fluometuron	*Cotoran*	5
	fluridone	*Sonar*	12
BROADAXE XC	s-metolachlor	*Dual Magnum*	15
	sulfentrazone	*Spartan 4F*	14
BRONATE	bromoxynil	*Maestro*	6
	MCPA	*MCPA*	4
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
	bromoxynil	*Maestro*	6
CHEETAH MAX	glufosinate	*Liberty*	10
	fomesafen	*Reflex*	14
CINCH ATZ [Cinch ATZ Lite]	s-metolachlor	*Dual II Magnum*	15
	atrazine	*AAtrex*	5
CLEARPATH	quinclorac	*Facet*	4
	imazethapyr	*Newpath*	2
COLT + SAUVO [Trump Card]	2,4-D	*2,4-D*	4
	fluroxypyr	*Starane*	4
COLT + SWORD	MCPA	*MCPA*	4
	fluroxypyr	*Starane*	4
CORVUS	thiencarbazone	*Varro*	2
	isoxaflutole	*Balance Flexx*	27
COYOTE	s-metolachlor	*Dual II Magnum*	15
	mesotrione	*Callisto*	27
CRUISHER	rimsulfuron	*Resolve*	2
	thifensulfuron	*Harmony*	2
CURTAIL	clopyralid	*Stinger*	4
	2,4-D	*2,4-D*	4
CURTAIL M	clopyralid	*Stinger*	4
	MCPA	*MCPA*	4
DEGREE XTRA	acetochlor	*Degree*	15
	atrazine	*AAtrex*	5
DIFLEXX DUO	dicamba	*DiFlexx*	4
	tembotrione	*Laudis*	27
DIMETRIC CHARGED	metribuzin	*Metribuzin*	5
	flumioxazin	*Valor*	14
ENLIST DUO	2,4-D	*2,4-D*	4
	glyphosate	*glyphosate*	9
ENLITE	chlorimuron	*Classic*	2
	thifensulfuron	*Harmony*	2
	flumioxazin	*Valor*	14
ENVIVE	chlorimuron	*Classic*	2
	thifensulfuron	*Harmony*	2
	flumioxazin	*Valor*	14
EXTREME	imazethapyr	*Pursuit*	2
	glyphosate	*glyphosate*	9
FIERCE EZ	flumioxazin	*Valor*	14
	pyroxasulfone	*Zidua*	15
FIERCE MTZ	flumioxazin	*Valor*	14
	pyroxasulfone	*Zidua*	15
	metribuzin	*Metribuzin*	5
FIERCE XLT	flumioxazin	*Valor*	14
	pyroxasulfone	*Zidua*	15
	chlorimuron	*Classic*	2
FINESSE	chlorsulfuron	*Glean*	2
	metsulfuron	*Ally*	2
FIRSTSHOT	thifensulfuron	*Harmony*	2
	tribenuron	*Express*	2
FLEXSTAR GT	fomesafen	*Flexstar*	14
	glyphosate	*glyphosate*	9
FOXFIRE	fenoxaprop	*Tecoma*	1
	pinoxaden	*Axial XL*	1
FULTIME NXT	acetochlor	*TopNotch*	15
	atrazine	*AAtrex*	5
FUSION	fluazifop	*Fusilade DX*	1
	fenoxaprop	*Puma*	1
GOLDSKY	pyrasulfotole	*PowerFlex HL*	27
	florasulam	------	2
GRAMIXONE MAGNUM*	fluroxypyr	*Starane*	4
	s-metolachlor	*Dual Magnum*	15
	paraquat	*Gramoxone*	22
GRAZONNEXT HL	aminopyralid	*Milestone*	4
	2,4-D	*2,4-D*	4
HALEX GT	s-metolachlor	*Dual Magnum*	15
	mesotrione	*Callisto*	27
	glyphosate	*glyphosate*	9
HARMONY EXTRA	thifensulfuron	*Harmony*	2
	tribenuron	*Express*	2
HARNESS MAX	acetochlor	*Harness*	15
	mesotrione	*Callisto*	27
HARNESS XTRA	acetochlor	*Harness*	15
	atrazine	*AAtrex*	5
HORNET	clopyralid	*Stinger*	4
	flumetsulam	*Python*	2
HUSKIE	pyrasulfotole	------	27
	bromoxynil	*Maestro*	6
HUSKIE COMPLETE	pyrasulfotole	------	27
	bromoxynil	*Maestro*	6
	thiencarbazone	*Varro*	2
IMPACT CORE	acetochlor	*Harness*	15
	topramezone	*Impact*	27
IMPACTZ	atrazine	*AAtrex*	5
	topramezone	*Impact*	27
INTERMOC	glufosinate	*Liberty*	10
	s-metolachlor	*Dual Magnum*	15
KATAGON	nicosulfuron	*Accent Q*	2
	tolpyralate	*Shieldex*	27
KEYSTONE NXT [Keystone LA NXT]	acetochlor	*Surpass NXT*	15
	atrazine	*AAtrex*	5
KOCHAVIORE	2,4-D	*2,4-D, others*	4
	fluroxypyr	*Starane*	4
	bromoxynil	*Maestro*	6
KYBER	flumioxazin	*Valor*	14
	pyroxasulfone	*Zidua*	15
	metribuzin	*Metribuzin*	5
LEADOFF	rimsulfuron	*Resolve*	2
	thifensulfuron	*Harmony*	2
	mesotrione	*Callisto*	27
LEXAR EZ	s-metolachlor	*Dual II Magnum*	15
	atrazine	*AAtrex*	5
	mesotrione	*Callisto*	27
LUMAX EZ	s-metolachlor	*Dual II Magnum*	15
	atrazine	*AAtrex*	5
MARVEL	flufthiacet	*Cadet*	14
	fomesafen	*Flexstar*	14
MAVERICK*	pyroxasulfone	*Zidua*	15
	clopyralid	*Stinger*	4
	flumetsulam	*Python*	2
NOVIXID	florpyrauxifen	*Loyant*	4
	penoxsulam	*Grasp*	2
OBEY	clomazone	*Command 3ME*	13
	quinclorac	*Facet*	4
OPENSKY	pyroxsulam	*PowerFlex HL*	2
	fluroxypyr	*Starane Ultra*	4
OPTILL	saflufenacil	*Sharpen*	14
	imazethapyr	*Pursuit*	2
ORION	florasulam	------	2
	MCPA	*MCPA*	4
OSPREY XTRA	mesosulfuron	*Osprey*	2
	thiencarbazone	*Varro*	2
PANOFLEX	thifensulfuron	*Harmony*	2
	tribenuron	*Express*	2
PERFECTMATCH	clopyralid	*Stinger*	4
	fluroxypyr	*Starane Ultra*	4
	pyroxsulam	*PowerFlex HL*	2
PERMIT PLUS	thifensulfuron	*Harmony*	2
	halosulfuron	*Permit*	2
PERPETUO	flumiclorac	*Resource*	14
	pyroxasulfone	*Zidua*	15
PIXXARO EC	fluroxypyr	*Starane*	4
	halauxifen	*Elevore*	4
PREFIX	s-metolachlor	*Dual Magnum*	15
	fomesafen	*Reflex*	14
PROGRESS	desmedipham	*Betenex*	5
	phenmedipham	------	5
	ethofumesate	*Nortron*	15
PULSAR	dicamba	*Clarity*	4
	fluroxypyr	*Starane*	4
QUELEX	halauxifen	*Elevore*	4
	florasulam	------	2
RAVE	triasulfuron	*Amber*	2
	dicamba	*Clarity*	4
RAZE	flucarbazone	*Everest*	2
	fluroxypyr	*Starane*	4
REALM Q	rimsulfuron	*Resolve*	2
	mesotrione	*Callisto*	27
REBELEX	cyhalofop	*Clincher*	1
	penoxsulam	*Grasp*	2
RESICORE XL*	clopyralid	*Stinger*	4
	acetochlor	*Surpass NXT*	15
	mesotrione	*Callisto*	27
RESOLVE Q	rimsulfuron	*Resolve*	2
	thifensulfuron	*Harmony*	2
RESTRAINT	acetochlor	*Harness*	15
	tolpyralate	*Shieldex*	27
REVOLN Q	nicosulfuron	*Accent Q*	2
	mesotrione	*Callisto*	27
REZUVANT	halauxifen	*Elevore*	4
	fluroxypyr	*Starane Ultra*	4
RIMFIRE MAX	pinoxaden	*Axial XL*	1
	propoxycarbazone	*Olympus*	2
	mesosulfuron	*Osprey*	2
ROUNDUP XTEND*	dicamba	*XtendiMax*	4
	glyphosate	*glyphosate*	9
SENTRALLAS	thifensulfuron	*Harmony*	2
	fluroxypyr	*Starane*	4
SEQUENCE	s-metolachlor	*Dual Magnum*	15
	glyphosate	*glyphosate*	9
SINATE	glufosinate	*Liberty*	10
	topramezone	*Impact*	27
SOLSTICE	mesotrione	*Callisto*	27
	flufthiacet	*Cadet*	14
SONIC	sulfentrazone	*Spartan*	14
	cloransulam	*FirstRate*	2
SPARTAN CHARGE	sulfentrazone	*Spartan*	14
	carfentrazone	*Aim*	14
STARANE FLEX	florasulam	------	2
	fluroxypyr	*Starane*	4
STARANE NXT	fluroxypyr	*Starane*	4
	bromoxynil	*Maestro*	6
STATUS	diflufenzopyr	------	19
	dicamba	*Clarity*	4
STEADFAST Q	nicosulfuron	*Accent Q*	2
	rimsulfuron	*Resolve*	2
STORM	bentazon	*Basagran*	6
	acifluorfen	*Ultra Blazer*	14
	fluroxypyr	*Starane*	4
SUPREMACY	thifensulfuron	*Harmony*	2
	tribenuron	*Express*	2
SUPREND	prometryn	*Caparol*	5
	trifloxysulfuron	*Envoke*	2
SURESTART II	acetochlor	*Surpass NXT*	15
	clopyralid	*Stinger*	4
	flumetsulam	*Python*	2
SURVEIL	flumioxazin	*Valor*	14
	cloransulam	*FirstRate*	2
SYNCHRONY XP	chlorimuron	*Classic*	2
	thifensulfuron	*Harmony*	2
TALINOR	bromoxynil	*Maestro*	6
	bicyclopyrone	------	27
TARZEC	pyroxsulam	*PowerFlex HL*	2
	halauxifen	*Elevore*	4
TAVIUM	dicamba	*XtendiMax*	4
	s-metholachlor	*Dual Magnum*	15
TRIPLEFLEX II	acetochlor	*Harness*	15
	clopyralid	*Stinger*	4
	flumetsulam	*Python*	2
TRIPZIN ZC	pendimethalin	*Prowl*	3
	metribuzin	*Metribuzin*	5
TRIVENCE	chlorimuron	*Classic*	2
	flumioxazin	*Valor*	14
	metribuzin	*Metribuzin*	5
TRIVOLT*	flufenacet	*Define*	15
	isoxaflutole	*Balance Flexx*	27
	thiencarbazone	*Varro*	2
VALOR XLT	flumioxazin	*Valor*	14
	chlorimuron	*Classic*	2
VARISTO	imazamox	*Raptor*	2
	bentazon	*Basagran*	6
VELPAR ALFAMAX	hexazinone	*Velpar*	5
	diuron	*Karmex*	5
VERDICT	saflufenacil	*Sharpen*	14
	dimethenamid-P	*Outlook*	15
WARRANT ULTRA	fomesafen	*Reflex*	14
	acetochlor	*Warrant*	15
WELD (FULL DECK)	MCPA	*MCPA*	4
	fluroxypyr	*Starane*	4
	clopyralid	*Stinger*	4
WIDEARMATCH	clopyralid	*Stinger*	4
	fluroxypyr	*Starane*	4
WIDEMATCH	clopyralid	*Stinger*	4
	fluroxypyr	*Starane*	4
WOLVERINE	fenoxaprop	*Tecoma*	1
	pyrasulfotole	------	27
	bromoxynil	*Maestro*	6
YUKON	dicamba	*Banvel*	4
	halosulfuron	*Permit*	2
ZEMAX	mesotrione	*Callisto*	27
	s-metolachlor	*Dual II Magnum*	15
ZIDUA PRO	imazethypyr	*Pursuit*	2
	saflufenacil	*Sharpen*	14
	pyroxasulfone	*Zidua*	15
ZONE DEFENSE	sulfentrazone	*Spartan 4F*	14
	flumioxazin	*Valor*	14