

W1947 (Revised January 2022)

North Dakota Herbicide Chart

Repeated use of herbicides with the same site of action alone 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 1) to maintain greater diversity in herbicide use and 2) to rotate among herbicides with different sites of action to delay the development of herbicide resistance.

The Site of Action Group is a classification system developed by the Weed Science Society of America and Herbicide

Site of Action Group	Site of Action	Number of resistant weed species in U.S.	Chemical Family	Active Ingredient	Product Examples Trade Name ®
1 Lipid Synthesis Inhibitors	ACCase Inhibitors (acetyl CoA carboxylase)	15	Aryloxyphenoxy propionate "Fop"	clodinafop-propargyl fenoxaprop-P ethyl fluzafop-P butyl quizalofop-P ethyl	Discover NG Parity, Tacoma, others Fusilade DX Assure II, Targa
			Cyclohexanedione "Dim"	clethodim sethoxydim	Select Max, Arrow, others Poast, others
			Phenylpyrazolin "Den"	pinoxaden	Axial XL
2 Amino Acid Synthesis Inhibitors	ALS Inhibitors (acetolactate synthase)	51	Imidazolinone "Imi"	imazamox imazapic imazethapyr	Beyond, Raptor Plateau Pursuit
			Sulfonylurea "SU"	halosulfuron mesosulfuron metsulfuron-methyl nicosulfuron rimsulfuron sulfosulfuron thifensulfuron tribenuron triflussulfuron	Permit, others Osprey Ally, Cimarron, Escort, others Accent Q Matrix, Resolve, others Outrider Harmony, others Express, others UpBeet
			Triazolopyrimidine "TPS"	cloransulam florasulam flumetsulam pyroxulam	FirstRate component of several Python PowerFlex, Teammate
			Triazolinones "SACT"	flucarbazone propoxycarbazone thiencarbazone	Everest 3.0, Prepare, others Olympus Varrow
9	EPSP Synthase Inhibitor (5-enolpyruvyl-shikimate 3-phosphate)	17	Glycine	glyphosate	Roundup, Durango, others
4 Auxin Mimics (Growth Regulators)	Synthetic Auxins TIR1, AFB5, and Specific Site Unknown	10	Benzoic acid	dicamba	Banvel, Clarity, Engenia, DiFlexx, Xtendimax, others
			Phenoxy	2,4-D MCPA	2,4-D, Enlist One, others MCPA, others
			Pyridine	clopyralid halauxifen-methyl	Stinger, others Elevore
			Pyridyloxy	fluroxypyr	Starane, others
			Quinoline	quinclorac	Facet
19	Auxin Transport Inhibitor	0	Aryl carboxylate	diflufenzopyr	component of Status
5 Photosynthesis Inhibitors	Photosystem II Inhibitors Serine 264 binders	28	Phenyl-carbamate	desmedipham phenmedipham	component of Betamix component of Betamix
			Triazine	atrazine	AAtrex, others
			Triazinone	metribuzin	Metribuzin, others
			Ureas	linuron	Lorox, others
6	Photosystem II Inhibitors Histidine 215 binders	1	Benzothiadiazole	bentazon	Basagran 5L, others
			Nitrile	bromoxynil	Buctril, others
			Phenyl pyridazine	pyridate	Tough
10 Nitrogen Metabolism Inhibitor	Glutamine Synthetase Inhibitor	2	Phosphinic acid	glufosinate	Liberty 280, others
			27 Pigment Inhibitors	HPPD Inhibitors	2
Pyrazole	pyrasulfotole topramezone	component of Huskie Armezon, Impact			
Triketone	mesotrione tembotrione bicyclopyrone	Callisto Laudis component of Acuron			
Benzoylpyrazole	tolpyralate	Shieldex			
14 Cell Membrane Disrupters	PPO Inhibitors	4	Diphenylether	acifluorfen fomesafen lactofen	Ultra Blazer Flexstar, Reflex, others Cobra, Phoenix
			N-phenylimide	flumiclorac flumioxazin fluthiacet-methyl saflufenacil tiafenacil	Resource Valor EZ Cadet Sharpen Reviton
			Phenylpyrazole	pyraflufen	ET, Vida
			Triazolinone	carfentrazone sulfentrazone	Aim Spartan
22	Photosystem I Electron Diverter	6	Bipyridilium	diquat paraquat	Reglone, others Gramoxone, others
3 Seedling Root Growth Inhibitors	Microtubule Assembly Inhibitors	6	Dinitroaniline	ethalfuralin pendimethalin trifluralin	Sonalan Prowl H ₂ O, others Treflan, others
			15 Seedling Shoot Growth Inhibitors	Very Long-Chain Fatty Acid Synthesis Inhibitor	8
Benzofuran	ethofumesate	Norton, others			
Isoxazoline	pyroxasulfone	Zidua SC			
Thiocarbamate	cycloate EPTC triallate	Ro-Neet SB Eptam, others Far-Go, Avadex MA			
31 COLD HARD STEEL		0			Cultivator, Plow, others

* indicates product is not registered for use at the time of printing. Check for a label and MSDS at www.cdms.net to confirm status.

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 Mode of Action chart on the left for more information.

Premix Trade Name ®	Component Trade Name ®	Active Ingredient	Site of Action Group
Acuron	AAtrex	atrazine	5
	Dual II Magnum	s-metolachlor	15
	Callisto	mesotrione	27
Acuron Flexi	Dual II Magnum	s-metolachlor	15
	Callisto	mesotrione	27
	-----	bicyclopyrone	27
Acuron GT	Roundup	glyphosate	9
	Dual II Magnum	s-metolachlor	15
	Callisto	mesotrione	27
	-----	bicyclopyrone	27
Afforia	Resolve	rimsulfuron	2
	Harmony	thifensulfuron	2
	Valor	flumioxazin	14
Anthem Flex	Aim	carfentrazone-ethyl	14
	Zidua	pyroxasulfone	15
Armezon Pro	Outlook	dimethenamid-P	15
	Armezon	topramezone	27
Authority Assist	Pursuit	imazethapyr	2
	Spartan	sulfentrazone	14
Authority First or Sonic	FirstRate	cloransulam	2
	Spartan	sulfentrazone	14
Authority MTZ	Metribuzin	metribuzin	5
	Spartan	sulfentrazone	14
Authority Supreme or Authority Edge	Spartan	sulfentrazone	14
	Zidua	pyroxasulfone	15
Axial Bold	Tacoma	fenoxaprop-P ethyl	1
	Axial XL	pinoxaden	1
Axial Star	Tacoma	fenoxaprop-P ethyl	1
	Starane	fluroxypyr	4
Boundary	Metribuzin	metribuzin	5
	Dual Magnum	s-metolachlor	15
BroadAxe XC or Authority Elite	Spartan	sulfentrazone	14
	Dual Magnum	s-metolachlor	15
Bronate	Maestro	bromoxynil	6
	MCPA	MCPA	4
Callisto Xtra	Callisto	mesotrione	27
	AAtrex	atrazine	5
Capreno	Varro	thiencarbazone	2
	Laudis	tembotrione	27
Carnivore	MCPA	MCPA	4
	Stinger	clopyralid	4
	Maestro	bromoxynil	6
Colt + Salvo or (Trump Card)	2,4-D	2,4-D	4
	Starane	fluroxypyr	4
Colt + Sword	MCPA	MCPA	4
	Starane	fluroxypyr	4
Corvus	Varro	thiencarbazone	2
	Balance Flexx	isoxaflutole	27
Curtail	Stinger	clopyralid	4
	2,4-D	2,4-D	4
Curtail M	Stinger	clopyralid	4
	MCPA	MCPA	4
DiFlex Duo	Clarity	dicamba	4
	Laudis	tembotrione	27
Enlist Duo	Enlist One	2,4-D	4
	Durango	glyphosate	9
Extreme	Pursuit	imazethapyr	2
	Roundup	glyphosate	9
Fierce EZ	Valor	flumioxazin	14
	Zidua	pyroxasulfone	15
	Valor	flumioxazin	14
Fierce MTZ or Kyber	Zidua	pyroxasulfone	15
	Metribuzin	metribuzin	5
	Roundup	glyphosate	9
Flexstar GT	Flexstar	fomesafen	14
	Roundup	glyphosate	9
Hallex GT	Dual II Magnum	s-metolachlor	15
	Callisto	mesotrione	27
Harness Max	Harness	acetochlor	15
	Callisto	mesotrione	27
Huskie	Buctril	bromoxynil	6
	-----	pyrasulfotole	27
Huskie Complete	Varro	thiencarbazone	2
	Buctril	bromoxynil	6
Huskie FX	-----	pyrasulfotole	27
	Varro	thiencarbazone	2
	Buctril	bromoxynil	6
Impact CORE	Harne	acetochlor	15
	Impact	topramezone	27
ImpactZ	AAtrex	atrazine	5
	Impact	topramezone	27
Instigate or Realm Q	Resolve	rimsulfuron	2
	Callisto	mesotrione	27
Intermoc	Interline	glufosinate	10
	Dual Magnum	s-metolachlor	15
Keystone NXT or Keystone LA NXT	Surpass NXT	acetochlor	15
	AAtrex	atrazine	5
Kochiavore	2,4-D	2,4-D	4
	Starane	fluroxypyr	4
	Maestro	bromoxynil	6
Lumax EZ	AAtrex	atrazine	5
	Dual II Magnum	s-metolachlor	15
Marvel	Callisto	mesotrione	27
	Flexstar	fomesafen	14
OpenSky	Cadet	fluthiacet-methyl	14
	Powerflex	pyroxulam	2
Panoflex	Starane	fluroxypyr	4
	Harmony	thifensulfuron	2
PerfectMatch	Express	tribenuron	2
	Powerflex	pyroxulam	2
Perpetuo	Stinger	clopyralid	4
	Starane	fluroxypyr	4
Pixxaro EC	Resource	flumiclorac	14
	Zidua	pyroxasulfone	15
Prefix	Elevore	halauxifen-methyl	4
	Starane	fluroxypyr	4
Quelex	Flexstar	fomesafen	14
	Dual Magnum	s-metolachlor	15
Resicore	-----	florasulam	2
	Elevore	halauxifen-methyl	4
Restraint	Harness	acetochlor	15
	Callisto	mesotrione	27
Revulin Q	Stinger	clopyralid	4
	Harness	acetochlor	15
Rezuvant	Shieldex	tolpyralate	27
	Accent Q	nicosulfuron	2
Sentrallas	Callisto	mesotrione	27
	Elevore	halauxifen-methyl	4
Sequence	Starane	fluroxypyr	4
	Axial XL	pinoxaden	1
Sinate	Harmony	thifensulfuron	2
	Starane	fluroxypyr	4
Spartan Charge	Dual Magnum	s-metolachlor	15
	Roundup	glyphosate	9
Starane Flex	Liberty	glufosinate	10
	Impact	topramezone	27
Starane NXT	Spartan	sulfentrazone	14
	Aim	carfentrazone	14
Status	-----	florasulam	2
	Starane	fluroxypyr	4
Steadfast Q	Starane	fluroxypyr	4
	Buctril	bromoxynil	6
Storm	Clarity	dicamba	4
	-----	diflufenzopyr	19
Supremacy	Accent	nicosulfuron	2
	Resolve	rimsulfuron	2
SureStart II or TripleFLEX II	Basagran	bentazon	6
	Ultra Blazer	acifluorfen	14
Survell	Harmony	thifensulfuron	2
	Express	tribenuron	2
Talinor	Starane	fluroxypyr	4
	Buctril	bromoxynil	6
Tavium	-----	bicyclopyrone	27
	Xtendimax	dicamba	4
Verdict	Dual Magnum	s-metolachlor	15
	Raptor	imazamox	2
Welder	Basagran	bentazon	6
	Sharpen	saflufenacil	14
WideMatch	Outlook	dimethenamid-P	15
	MCPA	MCPA	4
WideARMatch	Starane	fluroxypyr	4
	Stinger	clopyralid	4
Zone Defense	Stinger	clopyralid	4
	Starane	fluroxypyr	4
Zemax	Elevore	halauxifen-methyl	4
	Starane	fluroxypyr	4
Zidua Pro	Stinger	clopyralid	4
	Sharpen	saflufenacil	14
Zone Defense	Pursuit	imazethapyr	2
	Spartan	sulfentrazone	14
Zone Defense	Valor	flumioxazin	14



EXTENSION



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