

NOT FOR PUBLICATION
SUMMARY OF 2021
WEED CONTROL EXPERIMENTS

Department of Plant Sciences
North Dakota State University
Fargo, North Dakota

M. J. Christoffers
K. A. Howatt
A. Robinson

G. Gramig
J. T. Ikley

H. M. Hatterman-Valenti
T. J. Peters

Research Specialists/Technicians

D. Guimarães Abe
N.H. Haugrud
J. E. Mettler
R. Borgen

C. P. Auwarter
P. Ihry
R. P. Sabba

E. Brandvik
A. Lystad
T. Walter

S. A. DeSimini
S. F. Mark
G. Willoughby

Graduate Research Assistants

P. Beerbower
V. Kadium
A. Svyantek

S. Bogenrief
J. Lachowitz
M. Mzumara

E. Burt
K. Fiskness
B. Rana

A. Hoppe
J. Stith
Z. Pull

Contributors:

Dalley, Caleb - Hettinger Research Extension Center
Endres, Greg - Carrington Research Extension Center
Jenks, Brian - Minot Research Extension Center
Keene, Clair - Williston Research Extension Center
Ostlie, Mike - Carrington Research Extension Center

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METHODS

EPP = Early preplant	MPOST = Mid postemergence
PPI = Preplant incorporated	LPOST = Late postemergence
PEI = Preemergence incorporated	LLPOST = Late-late postemergence
PRE, PE = Preemergence	POST = Postemergence
EPOST = Early postemergence	POSTDIR = Postemergence Directed

FORMULATION

ACS = Aqueous capsule suspension	WP = Wettable powder
CS=Capsule suspension	WG, WDG = Water dispersible granules
DF = Dry Flowable	WSP, SP = Water Soluble powder
E, EC = Emulsifiable concentrate	G = Granules or Glon/A
FL, F = Flowable	S = Solution
L = Liquid flowable	SC=Suspension concentrate
ME = Micro-encapsulated	SE=Suspension emulsion
OD=Oil dispersion	SG = Soluble granules
WBF = Water-based flowable	

MISCELLANEOUS

F = Fall	AMS = ammonium sulfate
S = Spring	bee = butoxyethyl ester
Inc., I = Incorporation	dea = diethanolamine salt
Applic = Application	dga = diglycolamine
Cntl = Control	dma = dimethylamine salt
Inju = Injury	ioe = isooctyl ester
%ir, inju = Percent injury rating	MSO, MVO = methylated vegetable oil
%sr, %std, strd = Percent stand reduction	NIS = nonionic surfactant
HT = Plant height	PO, OC, POC = Petroleum oil concentrate (17% emulsifier)
SPK = Spike stage	SURF, S = Surfactant
Tswt, TW = Test weight	TMS = trimethylsulfonium salt
Yld = Yield	28N, UAN = 28% liquid nitrogen fertilizer
alk = alkanolamine salt	
AMN = ammonium nitrate	

KEY TO ABBREVIATIONS AND EVALUATIONS

Crop injury, crop stand and weed control ratings are based on a visual estimate using a scale of 0 = no effect to 100 = complete kill.

Abbreviation = Weed/Crop	Bayer Code	Abbreviation = Weed/Crop	Bayer Code
Alfa = Alfalfa	MEDSA	Nabe = Navy bean	PHSSS
Amar = Amaranth	AMA	Nfcf = Nightflowering catchfly	MELNO
Barl, Bar = Barley	HORVX	Oats = Tame oats	AVESA
Bdlf = Broadleaf	-	Pagf = Pale goosefoot	CHEPA
Biww = Biennial wormwood	ARTBI	Pest = Perennial sowthistle	SONAR
Bubu = Buffalobur	SOLCU	Pesw = Pennsylvania smartweed	POLPY
Bygr = Barnyardgrass	ECHCG	Pibe = Pinto bean	PHSSS
Cath = Canada thistle	CIRAR	Pigw = Pigweed	AMASS
Cano = Canola	BRSRC	Poam = Powell amaranth	AMAPO
Cocb = Common cocklebur	XANST	Pota = Potato	SOLTU
Colq = Common lambsquarters	CHEAL	Powe = Pondweed	PTMNO
Coma = Common mallow	MALNE	Prle = Prickley lettuce	LACSE
Copu = Common purslane	POROL	Prmi = Proso millet (tame)	PANMI
Corw = Common ragweed	AMBEL	Prpw = Prostrate pigweed	AMABL
Cram = Crambe	CRMAB	Prsp = Prostrate spurge	EPHHT
Cudo = Curly dock	RUMCR	Quin = Quinoa (chenopodium quinoa)	CHEQU
Dali = Dandelion	TAROF	Qugr = Quackgrass	AGRRE
Dobr = Downy brome	BROTE	Rrpw = Redroot pigweed	AMARE
Drbe = Dry bean	PHSSS	Ruth = Russian thistle	SASKR
Duru = Durum wheat	TRZDU	Safl, Saff = Safflower	-
Ebns = Eastern black nightshade	SOLPT	Shpu = Sheperdspurse	CAPBP
Eda=Edamame	-	Smwe = Annual smartweed	POLSS
Fach = False chamomile	MATMA	Soyb, Sobe = Soybean	GLXMA
Fibw = Field bindweed	CONAR	Spsp = Spotted spurge (prostrate spurge)	EPHMA
Fipc = Field pennycress	THLAR	Sugb, Sgbt = Sugarbeet	BEAVA
Fisb = Field sandbur	CCHIN	Snfl, Sufl = Sunflower	HELAN
Flwe = Flixweed	DESSO	Swcl = Sweet clover	MEUOF
Foba = Foxtail barley, Forage Barley	HORJU	Tabw = Tame buckwheat	POLSS
Fomi, Ftmi = Foxtail millet	SETIT	Tamu = Tansy mustard	-
Fota, Fxtl = Foxtail species	SETSS	Tumu = Tumble mustard	SSYAL
Girw = Giant ragweed	AMBTR	Tymu = Tame yellow mustard	-
Grtf = Green foxtail	SETVI	Vowh = Volunteer wheat	TRZAS
Gsft = Goosefoot	CHESS	Vele = Velvetleaf	ABUTH
HNS, Hans = Hairy nightshade	SOLSA	Vema = Venice mallow	HIBTR
Howe = Horseweed	ERICA	Wahe=Waterhemp	AMATA
HRSW = Hard red spring wheat	TRZAS	Wht = Volunteer wheat	TRZAS
KOCZ = Kochia	KCHSC	Wibw = Wild buckwheat	POLCO
Lath = Ladysthumb	POLPE	Wigr = witchgrass	PANCA
Lent = Lentils	LENCU	Wimu = Wild mustard	SINAR
Llsa = Lanceleaf sage	SALRE	Wioa = Wild oat	AVEFA
Mael = marshelder	IVAXA	Wipm = Wild-proso millet	PANMI
Mlgf = Mapleleaf goosefoot	CHEHQ	Yeft = Yellow foxtail	SETLU

Soil Test Results at Various Weed Experiment Locations

	Soil Texture	Organic Matter	pH	lb/A N	PPM	
					P	K
Absaraka, ND	Loam	2.0	7.2			
Ada, MN (Peters)	Sandy Clay Loam	2.2	8.2	49	4	48
Becker, MN	Sandy Loam	1.8	6.6	51	22	140
Blomkest, MN (Peters)	Silt Loam	6.5	6.9	Fertilized by test		
Casselton, ND	Silty Clay	4.0	7.9	Fertilized by test		
Crookston, MN	Sandy Clay Loam	3.1	8.0	211	6	105
Dwight	Sandy Clay Loam	1.7	7.9	50	4	60
Eckelson, ND	Loam	8.0	7.3	20	5	515
Fargo, ND (Airport)	Silty Clay	8.0	7.4	Fertilized by test		
Fargo, ND (campus)	Silty Clay	7.0	7.8	Fertilized by test		
Fargo, ND (section 22)	Silty Clay	5.0	7.4	Fertilized by test		
Foxhome, MN (Peters)	Sandy Loam	3.6	8.4	16	16	114
Geneseo, ND	Loam	6.0	4.0			
Glyndon, MN		4.6	8.1	Fertilized by test		
Hawley, MN	Loam	2.2	8.5	3	4	105
Hendrum, MN	Silty Clay	4.9	8.2	Fertilized by test		
Hettinger, ND	Silty Loam	2.9	6.7	Fertilized by test		
Hickson, ND (Peters)	Silty Clay	5.9	7.4	34	32	800
Hillsboro, ND	Sandy Loam	3.1	6.2	68	28	318
Horace, ND (KayJay)	Silty Clay Loam	4.3	8.1	11	5	210
Inkster, ND	Loamy sand	2.1	6.0	Fertilized by test		
Jamestown, ND (Pipestream Dam)	Loam	6.8	6.8	28	5	290
Manvel, ND (Peters)	Silt Loam	6.7	8.0	Fertilized by test		
Mayville, ND	Sandy Loam	2.9	7.1	16	18	80
Minot, ND	Loam	2.7	7.0	Fertilized by test		
Moorhead, MN (Peters)	Silty Clay Loam	5.1	8.0	55	36	460
Murdock, MN (Peters)				Fertilize by test		
Norcross, MN (Peters)	Loam	2.8	8.1	Fertilized by test		
Oakes, ND	Sandy Loam	2.0	6.8			
Oriska, ND	Silty Clay	4.1	7.4	Fertilized by test		
Oriska, ND (sunflower)	Sandy Loam	5.9	3.2			
Ottertail, MN	Sandy Loam	1.5	6.6		48	88
Park Rapids, MN	Sandy Loam	1.5	6.1	Fertilized by test		
Prosper, ND	Silty Clay Loam	4.3	7.0	90	41	350
Tappen, ND	Sandy Loam	1.8	7.6			
Valley City, ND	Fine Loam	8.2	6.7	11	15	640
Williston, ND	Loam	2.3	6.8	Fertilized by test		
Wyndmere, ND	Loamy Sand	1.9	5.7	Fertilized by test		

North Dakota Adjuvant Compendium

For other adjuvants: www.herbicide-adjuvants.com/

Nonionic Surfactant (NIS)			
Activator 90	Loveland	\$32/gal	0.25 to 0.5% v/v
APSA-80	Amway	\$32/gal	0.25 to 0.5% v/v
ChemSurf 90	Winfield United	\$32/gal	0.25 to 0.5% v/v
Haf-Pynt	Drexel	\$31/gal	0.25 to 0.5% v/v
Hypertonic	CHS	\$33/gal	0.25 to 0.5% v/v
Induce	Helena	\$31/gal	0.25 to 0.5% v/v
Insist 90	Wilbur-Ellis	\$24/gal	0.25 to 0.5% v/v
K-Tone	West Central	\$33/gal	0.25 to 0.5% v/v
Liberate LeciTech	Loveland	\$44/gal	0.25 to 0.5% v/v
Prefer 90	West Central	\$33/gal	0.25 to 0.5% v/v
Preference	Winfield United	\$35/gal	0.25 to 0.5% v/v
R-11	Wilbur-Ellis	\$32/gal	0.25 to 0.5% v/v
Rainier EA	Wilbur-Ellis	\$37/gal	0.25 to 0.5% v/v
Surf-AC 910	Drexel	\$25/gal	0.25 to 0.5% v/v
Tradition 93	Rosen's	\$ -/gal	0.25 to 0.5% v/v
Translate	Winfield United	\$38/gal	0.25 to 0.5% v/v
Vertex	Precision Labs	\$32/gal	0.25 to 0.5% v/v
Wet-Sol 99	Schaeffers	\$28/gal	0.25 to 0.5% v/v
Wetcit	Oro Agri	\$75/gal	0.25 to 0.5% v/v

NIS Approved for use in Water

Surfactants approved for use in bodies of water are

Activate Plus	Induce	Precise	Top Surf
AgriDex	Level 7	Preference	X-77
Class Act NG	Liberate L-Tech	R-11	

Surfactant & Silicone

Freeway	Loveland	\$110/gal	0.75 to 2 pt/100 gal
Kinetic	Helena	\$115/gal	0.75 to 2 pt/100 gal
Sil-Fact	Drexel	\$45/gal	0.75 to 2 pt/100 gal
Silkin	Winfield United	\$100/gal	0.75 to 2 pt/100 gal
Speed	Precision Labs	\$135/gal	0.25 to 2 pt/100 gal
Sur-Plus	Winfield United	\$87/gal	0.5 to 2 pt/100 gal
Sylcoat	Wilbur-Ellis	\$122/gal	0.75 to 2 pt/100 gal
Tacheon Duo	Precision Labs	\$79/gal	2 to 4 fl oz/A

Surfactant & Deposition/Retention (Drift Retardant)

Cerium Elite	West Central	\$41/gal	1 qt/100 gal
Fixate Pro	CHS	\$41/gal	1 qt/100 gal
MasterLock	Winfield United	\$55/gal	5 to 8 fl oz/A
Parachute II	West Central	\$42/gal	3 to 4 fl oz/A
Precise	Precision Labs	\$63/gal	1 to 2 pt/100 gal

Surfactant & Drift Retardant & Antifoam

Powerlock	Winfield United	\$55/gal	5 to 8 oz/A
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Surfactant & Nano-technology (carbon tubes)

Chem Xcel Gen 3	C&R Enterprise	\$63/gal	22-25 fl oz/gal herb.
Nano Excel	Enviro Science	\$ -/gal	2 to 8 fl oz/A
Nano-Revolution 3.0	Max Systems	\$145/gal	2 to 8 fl oz/A

Petroleum Oil Concentrate (POC/COC)

Agri-Dex	Helena	\$21/gal	1 to 2 pt/A
Crop Oil	West Central	\$14/gal	1 to 2 pt/A
Herbimax	Loveland	\$22/gal	1 to 2 pt/A
Peptoil	Drexel	\$12/gal	1 to 2 pt/A
Prime Oil	Winfield United	\$15/gal	1 to 2 pt/A
Protyx Aerial	Precision Labs	\$21/gal	0.5 pt/A
R-Way	Rosen's	\$ -/gal	1 to 2 pt/A
ROC Crop Oil	Wilbur-Ellis	\$15/gal	1 to 2 pt/A
Vigor	Precision Labs	\$15/gal	1 to 2 pt/A

Crop (Soybean) Oil Concentrate

BeanOil	Drexel	\$15/gal	1 to 2 pt/A
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High Surfactant Petroleum Oil Concentrate (HSPOC)

Between	Winfield United	\$20/gal	1 to 2 pt/A
Covrex	West Central	\$24/gal	1 to 2 pt/A
Diplomat	Rosens	\$21/gal	1 to 2 pt/A
Exchange	Precision Labs	\$26/gal	1 to 2 pt/A
Hi-Load	Simplot	\$26/gal	1 to 2 pt/A
High Load	Wilbur-Ellis	\$26/gal	1 to 2 pt/A
High Mark	Loveland	\$26/gal	1 to 2 pt/A
Penetrec	CHS	\$24/gal	1 to 2 pt/A
Superb HC	Winfield United	\$25/gal	1 to 2 pt/A

Methylated Seed Oil (MSO)

Emulate	CHS	\$22/gal	1 to 2 pt/A
Fire-Zone	Helena	\$27/gal	1 to 2 pt/A
Hasten	Wilbur-Ellis	\$34/gal	1 to 2 pt/A
MES-100	Drexel	\$15/gal	1 to 2 pt/A
MSO Leci-Tech	Loveland	\$27/gal	1 to 2 pt/A
MSO Ultra	Precision Labs	\$26/gal	1 to 2 pt/A
Noble	Winfield United	\$23/gal	1 to 2 pt/A
Persist Ultra	J.R. Simplot	\$20/gal	1 to 2 pt/A
Premium MSO	Helena	\$20/gal	1 to 2 pt/A
Succeed	Winfield United	\$19/gal	1 to 2 pt/A
Sundance II	Rosen's	\$21/gal	1 to 2 pt/A
Superspread MSO	Wilbur-Ellis	\$27/gal	1 to 2 pt/A
Upland MSO	West Central	\$22/gal	1 to 2 pt/A

MSO & Organosilicone Surfactant

Air Force	Winfield United	\$47/gal	4 to 6 fl oz/A
Dyne-Amic	Helena	\$57/gal	4 to 6 fl oz/A
Inergy	Winfield United	\$55/gal	4 to 6 fl oz/A
Persist Advanced	Precision Labs	\$100/gal	1 pt/100 gal
Sil-MES 100	Drexel	\$40/gal	4 to 6 fl oz/A
Syl-Tac	Wilbur-Ellis	\$63/gal	4 to 6 fl oz/A

MSO & Basic pH Blend

Entro	Various	\$28/gal	1 to 2 pt/A
Renegade EA	Wilbur-Ellis	\$30/gal	1 to 2 pt/A

MSO & Deposition/Retention (Drift Retardant)

StrikeLock	Winfield United	\$ -/gal	0.5 to 1 pt/A
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MSO & Surfactant & Deposition/Retention (Drift Retardant)

Plexus	Rosen's	\$ -/gal	10 to 12 fl oz/A
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High Surfactant Methylated Oil Concentrate (HSMOC)

Aggrestrol	CHS	\$37/gal	1 to 1.5 pt/A
Cide Winder	Helena	\$42/gal	1 to 1.5 pt/A
Destiny HC	Winfield United	\$40/gal	1 to 1.5 pt/A
Duce	Helena	\$36/gal	1 to 1.5 pt/A
Glacier EA	Wilbur-Ellis	\$50/gal	1 to 1.5 pt/A
Hot MES	Drexel	\$20/gal	1 to 1.5 pt/A
Hybrid	Miller	\$35/gal	1 to 1.5 pt/A
Kixyt	Precision Labs	\$44/gal	1 to 1.5 pt/A
Savvy	West Central	\$37/gal	1 to 1.5 pt/A
Top Shelf	Loveland	\$32/gal	1 to 1.5 pt/A

ADJUVANTS CONTAINING AMMONIUM
Ammonium sulfate (AMS) / Urea ammonium nitrate (UAN)

Fertilizer

AMS (Dry)	Various	\$0.35/lb	4 to 8.5 lb/100 gal
AMS (liquid)	Various	\$6-9/gal	2 to 4 qt/A
28% UAN/Bulk	Various	\$3-10/gal	2 to 4 qt/A

AMS & Surfactant (NIS)

Cayuse Plus	Wilbur-Ellis	\$27/gal	2 to 6 qt/100 gal
Class Act NG	Winfield United	\$13/gal	2.5% v/v
Class Act Flex	Winfield United	\$15/gal	1 to 4 % v/v
Deliver	Precision Labs	\$14/gal	2.5% v/v
Impressive DB	Rosen's	\$1.25/lb	2.25 lb/A
Powerhouse	Rosen's	\$12/gal	5 to 10 qt/100 gal
Precinct II	West Central	\$13/gal	2.5% v/v
Re-Duce	Helena	\$12/gal	1% v/v
Surfate	Loveland	\$23/gal	1% v/v
Ultra Surf AMS	Winfield United	\$10/gal	2.5% v/v
Wheelhouse II	CHS	\$13/gal	2.5% v/v

AMS & Drift Retardant (Deposition)

AMS 20/10	Winfield United	\$1.60/lb	10 lb/100 gal
Array	Rosen's	\$2.50/lb	9 lbs/100 gal
Lox Plus	Drexel	\$15/gal	1 to 2 gal/100 gal
StrikeZone MXD	Helena	\$5/gal	2 lb/100 gal
Vector	Rosen's	\$8/gal	2 lb/100 gal

AMS & Defoamer

AMS-Xtra	Drexel	\$4/gal	2.5 to 5% v/v
Omnix LDF	Precision Labs	\$9/gal	2.5 to 5% v/v

AMS & Deposition & Defoamer

AMS-Supreme	Drexel	\$15/gal	2.5 to 5% v/v
Border Xtra DF	Precision Labs	\$2/lb	18 lb/100 gal
Border Xtra 8L	Precision Labs	\$13/gal	2.5% v/v
Drift-Gard	Rosen's	\$ -/gal	9 lb/100 gal

AMS & Surfactant & Deposition & Defoamer

AMS-All	Drexel	\$11/gal	1 to 5 gal/100 gal
Blue Diamond	NWC,Emerado	\$15/gal	1 to 2 qt/100 gal
Bronc Triple	Wilbur-Ellis	\$43/gal	10 lb/100 gal
Pay Off Plus	Winfield United	\$2/lb	10 lb/100 gal
Zenith	Rosen's	\$1.80/lb	1.5 to 2.25 lb/A

AMS & Surfactant & Paraffinic oil

Flame	Loveland	\$42/gal	0.5% v/v
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AMS & WCA* (AMS Replacement)

Alliance	Winfield United	\$18/gal	1.25% v/v
Bronc Max	Wilbur-Ellis	\$25/gal	0.5 to 1% v/v
Choice W-Master	Loveland	\$30/gal	0.5% v/v
Enact	Rosen's	\$25/gal	0.5% v/v
SeQuel	Helena	\$17/gal	1 to 5 pt/100 gal
Transport LpH	Precision Lab	\$20/gal	0.5% v/v

AMS & WCA* & Deposition

AMS 2000	Winfield United	\$1.25/lb	10 to 17 lb/100 gal
AmSol Plus	Winfield United	\$6/gal	2.5 gal/100 gal
Double Down	Winfield United	\$8/gal	2.5 gal/100 gal
Rush	Winfield United	\$25/gal	2 to 4 qt/100 gal

AMS & WCA* & Deposition & Defoamer

Holzi	Drexel	\$1.60/lb	9 lb/100 gal
Stay Down	Rosen's	\$ -/gal	5 lb/100 gal

AMS & WCA* & Surfactant & Deposition & Defoamer

Veracity	West Central	\$26/gal	3 qt/100 gal
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Basic pH Blend

Axon	CHS	\$24/gal	1% v/v
Linkage	West Central	\$24/gal	1% v/v
Newtone	Winfield United	\$30/gal	1% v/v
Quad 7	Loveland	\$22/gal	1% v/v
Sequestra	Drexel	\$24/gal	1% v/v

Acidic AMS Replacement (contains AMADS)

AMADS - Monocarbamide dihydrogen sulfate = urea + sulfuric acid

Aduro	Winfield United	\$32/gal	4 pt/100 gal
Brimstone	Wilbur-Ellis	\$42/gal	4 pt/100 gal
ET-4000	MK Ag Service	\$31/gal	4 pt/100 gal
Fixate	CHS	\$32/gal	4 pt/100 gal
Gun Smoke	Loveland	\$40/gal	4 pt/100 gal
Hel-Fire	Helena	\$36/gal	4 pt/100 gal
Jackhammer	West Central	\$32/gal	4 pt/100 gal

Acidic WCA*

ET-4000	MK Ag Service	\$31/gal	4 pt/100 gal
Regulator 2.0	Max Systems	\$22/gal	2 to 4 qt/100 gal

Acidic WCA* & Surfactant & Base Oil

Simplyx	Precision Labs	\$40/gal	0.5 pt/A
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*Non ammonium / non-AMS water conditioning agent

ADJUVANTS CONTAINING NO AMMONIUM

WCA* / AMS Replacement

Choice Trio	Loveland	\$29/gal	0.5% v/v
Citron	Farm Direct	\$3.50/lb	2.2 lb/100 gal
Class Act Ridion	Winfield	\$-/gal	0.5 to 2% v/v
Cut-Rate	Wilbur-Ellis	\$2.75/lb	3 to 4 lb/100 gal
Quest/Request	Helena	\$22/gal	0.5% v/v
Speedway	Winfield United	\$38/gal	0.5% v/v

WCA* & Surfactant

Fastrack	Winfield United	\$28/gal	0.75% v/v
Flame	Loveland	\$42/gal	0.5% v/v
Jackhammer Elite	West Central	\$27/gal	2 qt/100 gal
Last Chance	West Central	\$-/gal	0.25 to 0.5% v/v
Level Best	CHS	\$-/gal	0.25 to 0.5% v/v
Transport Ultra	Precision Labs	\$39/gal	0.25 to 0.75% v/v
Wheelhouse Pro	CHS	\$27/gal	2 qt/100 gal

WCA* & HSMOC

Zaar	Helena	\$37/gal	1% v/v
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WCA* & Surfactant & Deposition/Retention & Defoamer

Deppex	CHS	\$62/gal	2 qt/100 gal
Enerpex	West Central	\$62/gal	2 qt/100 gal
Strike Force	Loveland	\$65/gal	2.5 qt/100 gal
Taragon Elite	Precision Labs	\$45/gal	2 qt/100 gal
Taragon Xtra	Precision Labs	\$54/gal	2 qt/100 gal
Trapline Pro II	CHS	\$51/gal	2 qt/100 gal
Veracity Elite II	West Central	\$51/gal	2 qt/100 gal
Weather-Gard	Loveland	\$65/gal	2 qt/100 gal
Complete Leci-Tec			

WCA* & Deposition/Retention & Defoamer

AccuQuest WM	Helena	\$36/gal	1 to 3 qt/100 gal
Formula 1	Winfield United	\$30/gal	1 to 3 qt/100 gal

*Non ammonium / non-AMS water conditioning agent

UTILITY ADJUVANTS

Deposition/Retention - Drift Retardants

Affect GC	Winfield United	\$40.00/qt	1 to 2 fl oz/100 gal
Acuvant	CHS	\$58/gal	2 to 6 fl oz/A
Cognitive 1	West Central	\$34/gal	2 to 4 qt/100 gal
Corral Poly	Winfield United	\$25/qt	4 to 12 fl oz/100 gal
Crosshair	Wilbur-Ellis	\$51/gal	4 fl oz/A
Direct	Precision Labs	\$34/qt	1 to 4 oz/100 gal
In-Place	Wilbur-Ellis	\$51/gal	4 fl oz/pt-lb herbic
Intact	Precision Labs	\$45/gal	2 qt/100 gal
InterLock	Winfield United	\$60/gal	4 fl oz/pt-lb herbic
Lox	Drexel	\$25/gal	4 to 6 fl oz/A
Mediate	West Central	\$30/gal	1 to 3 qt/100 gal
Nexum	Precision Labs	\$45/gal	4 fl oz/A
Placement	Winfield United	\$45/gal	4 to 8 fl oz/A
Point Blank	Helena	\$42/qt	2 to 6 fl oz/100 gal
Petrichor	West Central	\$58/gal	2 to 6 fl oz/A

Deposition/Retention & Defoamer

Compadre Leci-Tc	Loveland	\$58/gal	1 pt/100 gal
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Acidifying Agents

BS-500	Drexel	\$17/gal	2 to 4 pt/100 gal
Complete	Winfield United	\$44/gal	1 to 3 pt/100 gal
Denali EA	Wilbur-Ellis	\$35/gal	0.4 to 4 pt/100 gal
Indicate 5	Winfield United	\$48/gal	2 to 4 pt/100 gal
Induce pH	Helena	\$37/gal	2 to 4 pt/100 gal
LI-700 Leci-Tech	Loveland	\$39/gal	2 to 4 pt/100 gal
New Balance	Precision Lab	\$44/gal	2 to 4 pt/100 gal
SuperSpread 7000	Wilbur-Ellis	\$31/gal	0.5 to 2 pt/100 gal
Sequestra	Drexel	\$24/gal	1 to 5 gal/100 gal
Tri-Fol	Wilbur-Ellis	\$36/gal	0.5 to 4 pt/100 gal

Compatibility Agents

Blendex	Helena	\$55/gal	1 to 5 pt/100 gal
CompatibilityAgent	West Central	\$35/gal	1 to 3 pt/100 gal
Complete	Winfield United	\$44/gal	1 to 3 pt/100 gal
Convert	Precision Labs	\$50/gal	1 to 6 pt/100 gal
EZ-Mix	Loveland	\$38/gal	1 to 4 pt/100 gal
Mix	Drexel	\$20/gal	1 to 4 pt/100 gal
Mix-All	Rosen's	\$45/gal	1 to 4 pt/100 gal
Compatibility Plus	Winfield United	\$42/gal	1 to 2 pt/100 gal

Spray Tank Cleaners

Tank Cleaner	Various	\$12-25/qt	1 to 2 qt/100 gal
Tank Cleaner	Various	\$5-7/lb	1 to 2 lb/100 gal

Understanding a Water Quality Analysis Report

1. Water pH

Generally, the normal pH range of water used for application has little effect on herbicide efficacy. Carbamate and organophosphate insecticides quickly degrade through alkaline hydrolysis at water pH above 7. Water pH above 7 significantly increases degradation of Cobra, Resource, and Valor, however, these herbicides have very low water solubility and alkaline degradation would affect only the soluble fraction of the herbicide. Increasing water pH to 9 can reduce precipitation and nozzle plugging with the sugarbeet micro-rate treatment. Most sulfonylurea herbicides, POST HPPD herbicides, Select, Status, and Sharpen are more soluble at high pH and efficacy can be greater when applied in water with pH above 7. Some adjuvants marketed for glyphosate reduce water pH. Low pH forces some salt formulated herbicides into the acid state that may not be soluble in the amount of water being sprayed and thus plug nozzles and reduce efficacy. Herbicides need to be in solution for absorption into plant foliage. See #23 on page 73 for additional information.

2. Total Dissolved Solids and Electrical Conductivity

The major mineral constituents in Northern Plains water and their ionic charges are:

Cations (+ charge) = calcium (Ca), magnesium (Mg), sodium (Na), potassium (K), and iron (Fe).

Anions (- charge) = sulfate (SO₄), chloride (Cl), bicarbonate (HCO₃), and nitrate (NO₃).

The sum of all the minerals dissolved in a sample of water is normally referred to as the total dissolved solids (TDS). The higher the TDS, the more electric current water can conduct. Because of this characteristic, a measure of the electrical conductivity (EC) is often used to provide a quick, economical estimate of the TDS in water. If the EC is less than 500 umho/cm, water quality problems for herbicides are unlikely. Water EC values in ND and western U.S. run between 1000 and 2,500. Usually hardness and cation concentration, not TDS, are used to evaluate water quality on herbicide performance.

3. Hardness

Water hardness is caused by potassium, calcium, magnesium, and iron. These minerals can react and antagonize most all POST herbicides registered. Almost all POST herbicides are weak acid herbicides and can ionize (separate into neutral, + and - molecules) in acidic pH. Negative charged molecules can bind with cationic minerals resulting in antagonism. The ester formulations of growth regulator herbicides are oil soluble and do not react directly with the salts in the water. However, these oil type liquid herbicide formulations include an emulsifier to mix with water. Sometimes these emulsifiers when mixed in water with salts cause an oil-like scum or precipitate in the spray water reducing efficacy and plugging nozzles. Refer to pages 120 to 127 for a list amine or ester herbicide formulations.

Sodium contributes to water hardness but functions to soften water similar to home water softener systems. Hardness levels are reported in mg/L (ppm) of calcium carbonate (CaCO₃). Hardness values are calculated by adding meq/L of Ca and Mg then multiplying by 50. Hardness of individual cations can be confusing because they can be reported as milliequivalents/L (meq/L), milligrams per liter (mg/L), parts per million (ppm), or grains per U.S. gallon (gpg). The mg/L and ppm are considered equal, and 1 grain per gallon is equal to 17.1 mg/L or ppm.

To convert meq/L to ppm, multiply meq/L x atomic number of the atom: K meq/L x 39.102, Na x 22.991, Mg x 12.156, Ca x 20.04. Water hardness values in MT, ND, and MN run between 0 and 2,500 ppm. There are variations in water hardness classifications

but the following scale can be used:

Soft =	<75 ppm
Mod. hard =	75 – 150 ppm
Hard =	150 – 300 ppm
Very hard =	> 300 ppm

The amount of AMS needed to overcome antagonistic ions can be calculated as follows:

$$\text{Lbs AMS/100 gal} = (0.002 \times \text{ppm K}) + (0.005 \times \text{ppm Na}) + (0.009 \times \text{ppm Ca}) + (0.014 \times \text{ppm Mg}) + (0.042 \times \text{ppm Fe}).$$

This does not account for antagonistic minerals on the leaf surface on some species like lambsquarters, sunflower, and velvetleaf which may require additional AMS. Apply AMS at 8.5 lbs/100 gallons of water unless water hardness requires more.

4. Sodium Absorption Ratio

Water high in sodium, when added to clay soils, may have a detrimental effect. Excess sodium will attach to clay particles and displace other ions, namely chloride and sulfide. A high SAR may indicate a limited ability for plants to extract water from the soil. The adjusted SAR has reference to bicarbonates. Some water in the Northern Plains is very high in bicarbonates, which increases the SAR problem. Water quality standards for SAR are as follows:

Excellent =	<3
Good =	3 – 5
Permissible =	5 – 10
Doubtful =	10 – 15
Unsuitable =	>15

5. Residual Sodium Carbonate

Values greater than 0 increase the sodium hazard.

6. Bicarbonates

Since bicarbonate is anionic (-) it is always associated with a cation (+) like sodium or calcium to make sodium or calcium bicarbonate in ground water. The corresponding cation (Ca, Na) may have a greater role in herbicide antagonism than the bicarbonate. High sodium and sodium bicarbonate antagonism of herbicides is usually overcome by ammonia type adjuvants. Small amounts of antagonistic salts do not appear to reduce herbicide efficacy with full use rates. This is because the use rate was established for efficacy using various waters. However in principle to optimize herbicide efficacy, any amount of antagonistic salts will have some negative effect and to optimize efficacy for all conditions always apply AMS to overcome even low amounts of antagonistic salt.

Water with high bicarbonate levels may have low levels of other anions like chloride and sulfate. Calcium chloride is also antagonistic and spray water pH should be below 7. Bicarbonate levels greater than 500 ppm may reduce herbicide efficacy of Achieve, Poast, Select, MCPA amine, and 2,4-D amine. When using water with more than 500 ppm bicarbonates the high rate of these herbicides should be used and applied at the most susceptible weed stage for efficacy. Bicarbonate also increases water pH and high bicarbonate levels may also be associated with high water pH (See #1 above). Water bicarbonate levels in MT, ND, and MN range from 200 to 1,000 ppm.

Analysis of spray water sources can determine water quality effects on herbicide efficacy.

Water samples can be tested at:

USPS: NDSU Dept 7680, Fargo, ND 58108-6050,
UPS and Physical Address: NDSU Soil and Water Laboratory,
Waldron Hall 202, 1360 Bolley Dr. NDSU, Fargo, ND 58102.
701 231-7864.

North Dakota Herbicide Compendium

The listings are approximate average retail prices for small quantities. Herbicide prices do not include cost of additives, surfactants, oils, fertilizer or application costs. Prices vary depending on area of the state, wholesaler, bulk discounts, seasonal changes, quantities purchased and particular programs the manufacturing company offers. Consult local agricultural suppliers for exact price in area.

Product ^{Site of action}	Company	Brand Equiv.	Active ingredients	Formulation	\$/Unit	Product/A			Cost \$/A		
						Low	Med	High	Low	Med	High
Aatrex 4L ⁵	Syngenta	-	atrazine	4F	14.60 gal	0.75 pt	1.5 pt	2 pt	1.40	2.70	3.70
Aatrex Nine-O ⁵	Syngenta	-	atrazine	90DF	3.70 lb	0.42 lb	0.56 lb	0.83 lb	1.60	2.10	3.10
Abundit Edge ⁹	Corteva	RU PM	glyphosate-k salt	4.5SL	20.50 gal	22 fl oz	32 fl oz	44 fl oz	3.50	5.10	7.10
Accent Q ²	Corteva	Accent	nicosulfuron + isoxadifen safener	54.5DF	19.30 oz	0.67 oz	1.25 oz	1.8 oz	12.90	24.10	34.70
Accurate Extra ^{2,2,2}	FMC	Ally Extra	thifensulf & triben & metsulfuron	37.50+18.75+15DF	4.30 oz	10 A/pk	-	5 A/pk	0.85	-	1.70
Acumen ³	Tenkoz	Prowl	pendimethalin	3.3EC	34.70 gal	2.4 pt	3 pt	3.64 pt	10.40	13.00	15.80
Acuron ^{5,15,27,27}	Syngenta	-	atra&meto&meso&bicyclo&benox	1+2.14+0.24+.06ZC	64.80 gal	1.5 qt	2.25 qt	3 qt	24.30	36.50	48.60
AcuronFlex ^{15,27,27}	Syngenta	-	meto & meso & bicyclo & benox	2.86+0.32+.08ZC	87.60 gal	1.2 qt	-	2.25 qt	26.30	-	49.30
Affinity BrdSpec ^{2,2}	FMC	-	thifensulfuron & tribenuron 1:1	25 + 25SG	10.40 oz	0.4 oz	0.6 oz	1 oz	4.20	6.30	10.40
AffinityTankMix ^{2,2}	FMC	-	thifensulfuron & tribenuron 4:1	40 + 10SG	8.60 oz	0.6 oz	0.75 oz	1 oz	5.20	6.50	8.60
Afforia ^{2,14,2}	Corteva	-	flumioxazin & thifensulf & triben	40.8 & 5 & 5SG	5.90 oz	2.5 oz	3 oz	3.75 oz	14.80	17.80	22.20
Agility ^{4,2,2}	FMC	-	dicamba&thifen&triben&metsulf	57.8+4.7+2.4+1.9SG	2.30 oz	1.6 oz	2.4 oz	3.2 oz	3.60	5.40	7.20
Aim EC ¹⁴	FMC	-	carfentrazone-ethyl	2EC	173.00 qt	1/2 fl oz	-	1 fl oz	2.70	-	5.40
Alion ²⁹	Bayer	-	indaziflam	1.67EC	14.00 fl oz	5 fl oz	5.75 fl oz	6.5 fl oz	70.00	80.50	91.00
Alluvex ^{2,2}	Corteva	-	thifensulfuron & rimsulfuron 1:1	16.7 + 16.7SG	5.40 oz	1.5 oz	-	1.5 oz	8.10	-	8.10
Ally ²	FMC	-	metsulfuron-methyl	60XP	7.50 oz	0.05 oz	0.1 oz	0.3 oz	0.40	0.70	2.20
AllyExtra SG ^{2,2,2}	FMC	-	thifensulf & triben & metsulf	27.3+13.6+10.9SG	7.50 oz	0.3 oz	-	0.5 oz	2.30	-	3.80
Amber ²	Syngenta	-	triasulfuron	75DF	10.00 oz	0.14 oz	0.28 oz	0.56 oz	1.40	2.80	5.60
Anthem ^{14,15}	FMC	-	fluthiacet & pyroxasulfone	0.0632 + 2.09SC	2.80 fl oz	5 fl oz	9 fl oz	13 fl oz	14.00	25.20	36.40
AnthemATZ ^{5,14,15}	FMC	-	atra & fluthiacet & pyroxasulfone	4+0.014+0.485SC	101.80 gal	1.75 pt	2.75 pt	3.75 pt	22.30	35.00	47.70
AnthemFlex ^{14,15}	FMC	-	carfentrazone & pyroxasulfone	0.267 + 3.733SC	640.70 gal	2 fl oz	4 fl oz	4.5 fl oz	10.00	20.00	22.50
AnthemMaxx ^{14,15}	FMC	-	fluthiacet & pyroxasulfone	0.126 + 4.174SC	780.00 gal	2.5 fl oz	4.5 fl oz	6.5 fl oz	15.20	27.40	39.60
Armezon ²⁷	BASF	Impact	topramezone	2.8SC	17.50 fl oz	0.33 fl oz	0.5 fl oz	0.75 fl oz	5.80	8.80	13.10
ArmezonPro ^{27,15}	BASF	-	topramezone & dimethenamid	0.1 + 5.25SC	134.50 gal	16 fl oz	20 fl oz	24 fl oz	16.80	21.00	25.20
Arrow ¹	ADAMA	Select	clethodim	2EC	73.50 gal	4 fl oz	6 fl oz	8 fl oz	2.30	3.40	4.60
Arsenal ²	BASF	-	imazapyr-ipa salt	2AS	70.00 gal	1 qt	2 qt	3 qt	17.50	35.00	52.50
Assure II ¹	AMVAC	-	quizalofop-ethyl	0.88EC	92.70 gal	4 fl oz	8 fl oz	10 fl oz	2.90	5.80	7.20
Atra-5 ⁵	Drexel	-	atrazine	5F	20.30 gal	0.75 pt	1.5 pt	2 pt	1.90	3.80	5.10
Atrazine 4L ⁵	Several	-	atrazine	4L	13.50 gal	0.75 pt	1.5 pt	2 pt	1.30	2.50	3.40
Atrazine 90DF ⁵	Several	-	atrazine	90DF	3.60 lb	0.42 lb	0.83 lb	1.11 lb	1.50	3.00	4.00
Audit 1:1 ^{2,2}	UPL	-	thifensulfuron & tribenuron 1:1	25 + 25XP	11.00 oz	0.4 oz	0.6 oz	1 oz	4.40	6.60	11.00
Audit 4:1 ^{2,2}	UPL	-	thifensulfuron & tribenuron 4:1	40 + 10XP	8.30 oz	0.6 oz	0.75 oz	1 oz	5.00	6.20	8.30
Authority Assist ^{2,14}	FMC	-	imazethapyr & sulfentrazone	0.67 + 3.33L	2.50 fl oz	6 fl oz	7.5 fl oz	9 fl oz	14.90	18.60	22.40
Authority Edge ^{15, 14}	FMC	-	pyroxasulfone & sulfentrazone	1.52 + 2.73 SC	480.00 gal	8 fl oz	11 fl oz	14 fl oz	30.00	41.30	52.50
Authority Elite ^{15,14}	FMC	BroadAxe	S-metolachlor & sulfentrazone	6.3 + 0.7EC	105.00 gal	20 fl oz	25 fl oz	32 fl oz	16.40	20.50	26.30
Authority First ^{2,14}	FMC	Sonic	cloransulam & sulfentrazone	7.9 + 62.1WDG	4.40 oz	4 oz	6 oz	8 oz	17.70	26.60	35.40
Authority MTZ ^{5,14}	FMC	-	metribuzin & sulfentrazone	27 + 18WDG	33.00 lb	8 oz	12 oz	15 oz	16.50	24.80	30.90
Authority Supreme ^{14,15}	FMC	-	pyroxasulfone & sulfentrazone	2.08 + 2.08SC	403.00 gal	5 fl oz	8 fl oz	11 fl oz	15.70	25.20	34.60
Autumn Super ^{2,2}	Bayer	-	iodosulfuron & thien carbazole	6 + 45WDG	23.00 oz	0.5 oz	-	0.5 oz	11.50	-	11.50
Avadex MA ¹⁵	Gowan	Far-Go	triallate	10G	1.40 lb	10 lb	12.5 lb	15 lb	14.00	17.50	21.00
Avalanche Ultra ¹⁴	Winfield	-	acifluorfen-Na salt	2SL	66.90 gal	1 pt	1.5 pt	2 pt	8.40	12.50	16.70
Axial Bold ^{1,1}	Syngenta	-	Fenoxaprop + pinoxaden	0.457 + 0.228 EC	122.00 gal	15 fl oz	-	15 fl oz	14.30	-	14.30
Axial Star ^{4,1}	Syngenta	-	fluroxypyr & pinoxaden & safnr	0.73 + 0.42EC	122.00 gal	16.4 fl oz	-	16.4 fl oz	15.60	-	15.60
Axial XL ¹	Syngenta	-	pinoxaden&cloquintocet safener	0.42EC	116.00 gal	16.4 fl oz	-	16.4 fl oz	14.90	-	14.90
Axiom DF ^{5,15}	Bayer	-	metribuzin + flufenacet	13.6 + 54.4DF	30.00 lb	7 oz	13 oz	20 oz	13.10	24.40	37.50
Balance Flex ²⁷	Bayer	-	isoxaflutole & cyprosulfamide	2SC	3.90 fl oz	3 fl oz	4.5 fl oz	6 fl oz	11.60	17.40	23.20
Basagran ⁶	Several	-	bentazon-Na salt	4SL	58.40 gal	1 pt	1.5 pt	2 pt	7.30	11.00	14.60
Basagran 5L ⁶	BASF	Basgran	bentazon-Na salt	5SL	60.00 gal	0.8 pt	1.2 pt	1.6 pt	6.00	9.00	12.00
Basis Blend ^{2,2}	Corteva	ResolveQ	rimsulfuron & thifen & isoxadifen	20 + 10SG	7.20 oz	1.25 oz	-	1.5 oz	8.90	-	10.70
Batalium ^{2,6,4}	UPL	-	flucarbazone + bromoxy + fluroxy	0.25 + 2.34 + 0.88EC	212.00 gal	13.7 fl oz	-	13.7 fl oz	22.70	-	22.70
Beacon ²	Syngenta	-	primisulfuron-methyl	75DF	36.00 oz	0.38 oz	0.5 oz	0.76 oz	13.70	18.00	27.40
Bentazon ⁶	Willowood	Basagran	bentazon-Na salt	4SL	49.00 gal	1 pt	1.5 pt	2 pt	6.10	9.20	12.30
Beyond ²	BASF	Raptor	imazamox-NH ₄ salt	1SL	459.00 gal	2 fl oz	3 fl oz	4 fl oz	7.20	10.80	14.30

Product ^{Site of action}	Company	Brand Equiv.	Active ingredients	Formulation	\$/Unit	Product/A			Cost \$/A		
						Low	Med	High	Low	Med	High
Bicep II Magnum ^{5,15}	Syngenta	-	atrazine & S-metolachlor	3.1 + 2.4L	41.20 gal	2.1 qt	2.35 qt	2.6 qt	21.60	24.20	26.80
Bicep Lite II Magnum ^{5,15}	Syngenta	-	atrazine & S-metolachlor	2.67 + 3.23L	53.00 gal	1.5 qt	1.9 qt	2.2 qt	19.90	25.20	29.20
Bison ^{6,4}	Winfield	Bronate	bromoxynil ester & MCPA ester	2 + 2EC	53.00 gal	1 pt	1.5 pt	2 pt	6.60	9.90	13.20
Blanket ¹⁴	Tenkoz	Spartan	sulfentrazone	4L	227.00 gal	3 fl oz	4.5 fl oz	6 fl oz	5.30	8.00	10.60
Boundary ^{15,5}	Syngenta	-	S-metolachlor & metribuzin	5.25 + 1.25L	82.50 gal	1.2 pt	1.6 pt	2.45 pt	12.40	16.50	25.30
Brash ^{4,4}	Winfield	Weedmstr	2,4-D-dma & dicamba-dma salt	2.87 + 1SL	26.40 gal	0.5 pt	2 pt	4 pt	1.60	6.60	13.20
Brawl ¹⁵	Tenkoz	Dual Mag	S-metolachlor	7.62EC	75.00 gal	1.33 pt	1.67 pt	2 pt	12.50	15.70	18.80
Brawl II ¹⁵	Tenkoz	Dual II M	S-metolachlor & benoxacor safen	7.64EC	80.00 gal	1.33 pt	1.67 pt	2 pt	13.30	16.70	20.00
Breakfree ¹⁵	Corteva	Surpass	acetochlor & dichlormid safener	6.4EC	65.00 gal	1.5 pt	2 pt	2.25 pt	12.20	16.30	18.30
Breakfree NXT Lite ^{15,5}	Corteva	Harness X	acetochlor & atrazine	4.3 + 1.7L	35.70 gal	1.5 qt	1.8 qt	2.1 qt	13.40	16.00	18.70
Broadrange 55 ⁴	Wilbur-Ellis	2,4-D	2,4-D-diethylamine salt	5.03L	36.00 gal	0.38 pt	0.75 pt	1.5 pt	1.70	3.40	6.80
BroadAxe XC ^{15,14}	Syngenta	Auth. Elite	S-metolachlor & sulfentrazone	6.3 + 0.7EC	114.60 gal	20 fl oz	25 fl oz	32 fl oz	17.90	22.40	28.60
Broclean ⁶	Loveland	Buctril	bromoxynil-ester	2EC	58.10 gal	1 pt	1.5 pt	2 pt	7.30	10.90	14.50
Bromac ^{6,4}	Loveland	Bronate	bromoxynil-ester & MCPA-ester	2 + 2EC	53.60 gal	1 pt	1.5 pt	2 pt	6.70	10.00	13.40
Bromac Advanced ^{6,4}	Loveland	Bron. Adv.	bromoxynil-ester & MCPA-ester	2.5 + 2.5EC	63.70 gal	0.8 pt	1.2 pt	1.6 pt	6.40	9.50	12.70
Brox ⁶	Albaugh	Buctril	bromoxynil-ester	2EC	48.00 gal	1 pt	1.5 pt	2 pt	6.00	9.00	12.00
Brox M ^{6,4}	Albaugh	Bronate	bromoxynil-ester & MCPA-ester	2 + 2EC	47.00 gal	1 pt	1.5 pt	2 pt	5.90	8.80	11.80
Brox M Ultra ^{6,4}	Albaugh	Bron. Adv.	bromoxynil-ester & MCPA-ester	2.5 + 2.5EC	60.00 gal	0.8 pt	1.2 pt	1.6 pt	6.00	9.00	12.00
Buccaneer/Plus ⁹	Tenkoz	Roundup	glyphosate-ipa salt	3SL	22.00 gal	2 pt	3 pt	4 pt	5.50	8.30	11.00
Buckle ^{15,3}	Gowan	-	triallate + trifluralin	10 + 3	1.50 lb	10 lb	-	12.5 lb	15.00	-	18.80
Butyrac 200 ⁴	Albaugh	-	2,4-DB-dma salt	2SL	27.80 gal	2 pt	3 pt	4 pt	6.90	10.40	13.90
Cadet ¹⁴	FMC	-	fluthiacet-methyl	0.91SL	300.00 qt	0.4 fl oz	0.65 fl oz	0.9 fl oz	3.80	6.10	8.40
Callisto ²⁷	Syngenta	-	mesotrione	4SE	306.40 gal	2 fl oz	2.5 fl oz	3 fl oz	4.80	6.00	7.20
Callisto GT ^{27,9}	Syngenta	-	mesotrione & glyphosate	0.38 + 3.8SE	40.20 gal	2 pt	-	2 pt	10.10	-	10.10
Callisto Xtra ^{27,5}	Syngenta	-	mesotrione & atrazine	0.5 + 3.2SC	50.00 gal	15 fl oz	22 fl oz	24 fl oz	5.90	8.60	9.40
Candor ^{4,4}	Nufarm	Crossbow	triclopyr-bee & 2,4-D-bee	1 + 2SL	42.00 gal	1 qt	3 qt	6 qt	10.50	31.50	63.00
Capreno ^{27,2}	Bayer	-	tembo & thiencarbazone & isox	2.88 + 0.57SC	4.40 fl oz	3 fl oz	-	3 fl oz	13.20	-	13.20
Capstone ^{4,4}	Corteva	-	aminopyralid-3ipNH ₄ & triclopyr	0.1 + 1SL	53.00 gal	4 pt	5 pt	6 pt	26.50	33.10	39.80
Carnivore ^{4,4,6}	Winfield	-	MCPA & fluroxypyr & bromoxynil	1.67+0.67+1.67EC	55.00 gal	1 pt	1.5 pt	2 pt	6.90	10.30	13.80
Casoron 4G ²⁹	UPL	-	dichlobenil	4G	3.10 lb	100 lb	150 lb	200 lb	310	465	620
Chaparral ^{4,2}	Corteva	-	aminopyralid-K salt+ metsulfuron	52.5 + 9.45DF	93.50 lb	1 oz	2 oz	3 oz	5.80	11.70	17.50
Charger Basic ¹⁵	Winfield	Dual Mag.	S-metolachlor	7.62EC	53.80 gal	1.33 pt	1.67 pt	2 pt	8.90	11.20	13.40
Charger Max ¹⁵	Winfield	Dual II M	S-metolachlor & benoxacor safen	7.64EC	57.70 gal	1.33 pt	1.67 pt	2 pt	9.60	12.00	14.40
Chateau ¹⁴	Valent	Valor	flumioxazin	51WDG	4.60 oz	1.5 oz	2 oz	2.5 oz	6.90	9.20	11.50
Cheetah ¹⁰	Nufarm	Liberty	glufosinate-NH ₄ salt	2.34SL	40.00 gal	29 fl oz	32 fl oz	43 fl oz	9.10	10.00	13.40
Cheetah Max ^{14,10}	Nufarm	-	fomesafen & glufosinate-NH ₄ salt	1 + 2SL	-	24 fl oz	-	24 fl oz	-	-	-
Cimarron X-tra ^{2,2}	Bayer	-	chlorsulfuron & metsulfuron	37.5 + 30DF	17.00 oz	0.5 oz	1 oz	2 oz	8.50	17.00	34.00
Cinch ¹⁵	Corteva	Dual II M	S-metolachlor & benoxacor safen	7.64EC	107.50 gal	1.33 pt	1.67 pt	2 pt	17.90	22.40	26.90
Cinch ATZ Lite ^{5,15}	Corteva	Bicep II L	atrazine & S-metolachlor	2.67 + 3.23L	41.30 gal	1 qt	1.5 qt	1.9 qt	10.30	15.50	19.60
Clarity ⁴	BASF	-	dicamba-dga salt	4SL	91.40 gal	4 fl oz	8 fl oz	16 fl oz	2.90	5.70	11.40
Clash ⁴	Nufarm	Clarity	dicamba-dga salt	4SL	80.00 gal	2 fl oz	4 fl oz	8 fl oz	1.30	2.50	5.00
Clean Slate ⁴	Nufarm	Stinger	clopyralid-monoethanolamine salt	3SL	185.00 gal	1.3 fl oz	2.6 fl oz	0.25 pt	1.90	3.80	5.80
Cleansweep D ^{4,4,6}	Nufarm	-	fluroxypyr-e & 2,4-D-e & bromox	0.64 + 1.6 + 2EC	70.00 gal	1 pt	1.25 pt	1.5 pt	8.80	10.90	13.10
Cleansweep M ^{4,4,6}	Nufarm	-	fluroxypyr-e & MCPA-e & bromox	0.67+1.67+1.67 EC	64.30 gal	1 pt	1.5 pt	2 pt	8.00	12.10	16.10
CleanTraxx ^{1,14}	Corteva	-	penoxsulam & oxyfluorfen	0.083 + 3.93EC	-	3pt	3.75 pt	4.5 pt	-	-	-
CleanWave ^{4,4}	Corteva	-	aminopyralid & fluroxypyr	0.08 + 1.12EC	65.10 gal	10 fl oz	12 fl oz	14 fl oz	5.10	6.10	7.10
Clethodim ¹	Several	Select	clethodim	2EC	85.00 gal	4 fl oz	6 fl oz	8 fl oz	2.70	4.00	5.30
Cobra ¹⁴	Valent	-	lactofen	2EC	208.90 gal	8 fl oz	10 fl oz	12.5 fl oz	13.10	16.30	20.40
Collide ¹⁴	UPL	Goal	oxyfluorfen	2EC	98.00 gal	4 pt	6 pt	8 pt	49.00	73.50	98.00
Colt AS ^{4,4}	Loveland	WideMatch	clopyralid-MEAsalt & fluroxypyr-e	0.75 + 0.75EC	56.00 gal	1 pt	1.25 pt	1.33 pt	7.00	8.80	9.30
Colt + Salvo ^{4,4}	Loveland	-	fluroxypyr-ester & 2,4-D-ester	0.75 + 3EC	48.20 gal	1 pt	1.33 pt	1.67 pt	6.00	8.00	10.10
Colt + Sword ^{4,4}	Loveland	-	fluroxypyr-ester & MCPA-ester	0.71 + 2.84EC	57.00 gal	1.125 pt	1.5 pt	2 pt	8.00	10.70	14.30
Comet ⁴	Nufarm	Starane	fluroxypyr-ester	1.5EC	64.50 gal	0.5 pt	0.67 pt	1 pt	4.00	5.40	8.10
Confidence ¹⁵	Winfield	Harness	acetochlor & safener	7EC	60.90 gal	1.25 pt	1.75 pt	2.25 pt	9.50	13.30	17.10
Confidence Xtra ^{15,5}	Winfield	Harness X	acet & dichlormid & atra	4.3 + 1.7F	38.00 gal	1.2 qt	1.5 qt	1.8 qt	11.40	14.30	17.10
Cornerstone/Plus ⁹	Winfield	Roundup	glyphosate-ipa salt	3SL	14.70 gal	2 pt	3 pt	4 pt	3.70	5.50	7.30
Corvus ^{27,2}	Bayer	-	isox&thiencarbazone&cyprosulf	1.88 & 0.75SC	6.10 fl oz	3.3 fl oz	4.5 fl oz	5.6 fl oz	20.10	27.40	34.10

Product ^{Site of action}	Company	Brand Equiv.	Active ingredients	Formulation	\$/Unit	Product/A			Cost \$/A		
						Low	Med	High	Low	Med	High
Credit 41 Extra ⁹	Nufarm	Roundup	glyt-ipa salt	3SL	15.00 gal	2 pt	3 pt	4 pt	3.80	5.60	7.50
Credit Xtreme ⁹	Nufarm	-	glyphosate-ipa & K salt	2.5 + 2 SL	18.00 gal	22 fl oz	32 fl oz	44 fl oz	3.10	4.50	6.20
Crossbow ^{4,4}	Corteva	-	triclopyr-bee & 2,4-D-bee	1 + 2SL	48.20 gal	1 qt	3 qt	6 qt	12.10	36.20	72.30
Curtail ^{14,4}	Corteva	-	clopyralid-mea & 2,4-D-3ipa salt	0.38 + 2SL	56.50 gal	2 pt	2.67 pt	4 pt	14.10	18.80	28.20
Curtail M ^{4,4}	Corteva	-	clopyralid-acid & MCPAioester	0.42 + 2.35SL	64.40 gal	1.75 pt	2 pt	2.33 pt	14.10	16.10	18.80
Dacthal ³	AMVAC	-	DCPA	6F	189.00 gal	8 pt	10 pt	14 pt	189	236	331
Dacthal ³	AMVAC	-	DCPA	75WDG	20.00 lb	8 lb	10 lb	14 lb	160	200	280
Deadbolt ^{6,4}	Wilbur-Ellis	-	bromoxynil-ester & 2,4-D-ester	2 + 2.5EC	68.00 gal	12.8 fl oz	-	12.8 fl oz	6.80	-	6.80
Defol	Drexel	Na chlorat	Sodium chlorate	5SL	5.90 gal	4.8 qt	-	4.8 qt	7.10	-	7.10
Detonate ⁴	Tenkoz	Banvel	dicamba-dma salt	4SL	76.50 gal	4 fl oz	8 fl oz	16 fl oz	2.40	4.80	9.60
Diablo ⁴	Nufarm	Banvel	dicamba-dma salt	4SL	46.00 gal	4 fl oz	8 fl oz	16 fl oz	1.40	2.90	5.80
Dicamba ⁴	Several	Banvel	dicamba-dma salt	4SL	47.60 gal	4 fl oz	8 fl oz	16 fl oz	1.50	3.00	6.00
DiFlexx ⁴	Bayer	Clarity	dicamba-dga & cyrosulfamide	4SL	207.00 gal	8 fl oz	12 fl oz	16 fl oz	12.90	19.40	25.90
DiFlexx Duo ^{4,27}	Bayer	-	dic-dga & tembotrione & safener	1.86 + 0.27SC	98.10 gal	24 fl oz	32 fl oz	40 fl oz	18.40	24.50	30.70
Dimetric EXT ⁵	Winfield	Sencor	metribuzin	75DF	17.50 lb	0.25 lb	0.33 lb	0.5 lb	4.40	5.80	8.70
Dimetric ⁵	Winfield	Sencor	metribuzin	3F	70.00 gal	0.5 pt	0.67 pt	1 pt	4.40	5.90	8.70
Diquat ²²	Nufarm	Reglone	diquat-dibromide salt	2SL	151.10 gal	1 pt	1.5 pt	2 pt	15.10	17.10	18.90
Discover NG ¹	Syngenta	-	clodinafop & oil adjuvant	0.5EC	45.50 gal	12.8 floz	14.5 floz	16 fl oz	5.70	8.50	11.40
Distinct ^{4,19}	BASF	-	dicamba & diflufenzopyr	0.5 + 0.2WDG	40.00 lb	2 oz	4 oz	6 oz	5.00	10.00	15.00
Diuron ⁵	Several	-	diuron	80WDG	4.20 lb	0.75 lb	2 lb	6 lb	3.10	8.30	24.90
Dog Fight ^{2,9}	Loveland	Extreme	imazethapyr-acid & glyt-ipa salt	0.17 + 2SL	26.60 gal	1.5 pt	2.25 pt	3 pt	5.00	7.50	10.00
Double Header ^{15,27}	Loveland	-	acetochlor & mesotrione	3.2 + 0.38	47.50 gal	1.7 qt	2 qt	2.4 qt	20.20	23.80	28.50
Draft ^{2,2}	Rotam	Harm Extr	thifensulfuron & tribenuron	50 + 25DF	17.00 oz	0.3 oz	-	0.3 oz	5.10	-	5.10
Dual Magnum ¹⁵	Syngenta	-	S-metolachlor	7.62EC	84.90 gal	1.33 pt	1.67 pt	2 pt	14.10	17.70	21.20
Dual II Magnum ¹⁵	Syngenta	-	S-metolachlor & benoxacor safen	7.64EC	96.40 gal	1.33 pt	1.67 pt	2 pt	16.00	20.10	24.10
DuraCor ^{4,4}	Corteva	-	aminopyralid + floryprauxifen	0.667 + 0.067SL	86.30 gal	12 fl oz	16 fl oz	20 fl oz	8.10	10.80	13.50
Duramax ⁹	Corteva	Rodeo	glyphosate-dma salt	4SL	30.00 gal	24 fl oz	36 fl oz	48 fl oz	5.60	8.40	11.30
Durango DMA ⁹	Corteva	Roundup	glyphosate-dma salt	4SL	15.20 gal	24 fl oz	36 fl oz	48 fl oz	2.80	4.30	5.70
Elevore ⁴	Corteva	-	halauxifen-methyl	0.572 EC	944.70 gal	1 fl oz	-	1 fl oz	7.40	-	7.40
Encompass ¹⁴	Tenkoz	Valor	flumioxazin	51WDG	6.00 oz	2 oz	2.5 oz	3 oz	12.00	15.00	18.00
Engenia ⁴	BASF	-	dicamba-BAPMA salt	5SL	83.00 gal	12.8 fl oz	19.2 fl oz	25.6 fl oz	8.30	12.50	16.60
Enlist Duo ^{9,4}	Corteva	-	glyphosate-dma & 2,4-D-choline	1.7 + 1.6SL	28.70 gal	3.5 pt	4 pt	4.75 pt	12.50	14.30	17.00
Enlist One ⁴	Corteva	-	2,4-D-choline	3.8SL	43.80 gal	1 pt	1.5 pt	2 pt	5.50	8.20	11.00
Eptam ¹⁵	Gowan	-	EPTC	7EC	53.60 gal	2.3 pt	4 pt	6.75 pt	15.40	26.80	45.20
Escort XP ²	Bayer	Ally	metsulfuron-methyl	60XP	7.00 oz	0.33 oz	1 oz	2 oz	2.30	7.00	14.00
Establish ¹⁵	Tenkoz	Outlook	dimethenamid	6EC	180.00 gal	16 fl oz	18 fl oz	21 fl oz	22.50	25.30	29.50
Ethofumesate ¹⁶	Willowood	Nortron	ethofumesate	4SC	70.00 gal	6 pt	7 pt	7.5 pt	52.50	61.30	65.60
Ethotron ¹⁶	UPL	Nortron	ethofumesate	4EC	71.80 gal	6 pt	7 pt	7.5 pt	53.90	62.80	67.30
Everest 3.0 ²	UPL	-	flucarbazone-Na salt & safener	1.75OD	8.50 fl oz	1.5 fl oz	-	2 fl oz	12.70	-	17.00
EverPreX ¹⁵	Corteva	-	S-metolachlor	7.62 EC	68.60 gal	1.33 pt	1.67 pt	2 pt	11.40	14.30	17.20
Express SG ²	FMC	-	tribenuron-methyl	50SG	16.90 oz	1/4 oz	1/3 oz	1/2 oz	4.20	5.60	8.50
Extra Credit 5 ⁹	Nufarm	Roundup	glyphosate-ipa salt	3.75SL	28.00 gal	1.6 pt	2.4 pt	3.2 pt	5.60	8.40	11.20
Extreme ^{2,9}	BASF	-	imazethapyr-acid & glyt-ipa salt	0.17 + 2SL	26.30 gal	1.5 pt	2.25 pt	3 pt	4.90	7.40	9.90
Fallow Star ^{9,4}	Albaugh	Fallow Mst	glyt-ipa & dicamba-ipa salt	1.1 + 0.5SL	18.80 gal	22 fl oz	32 fl oz	44 fl oz	3.20	4.70	6.50
Far-Go EC ¹⁵	Gowan	-	trillate	4EC	55.70 gal	1 qt	1.25 qt	1.5 qt	13.90	17.40	20.90
Facet L ^{4,0}	BASF	-	quinclorac	1.5L	115.90 gal	22 fl oz	32 fl oz	64 fl oz	19.90	29.00	57.90
FeXapan ⁴	Corteva	XtendiMax	dicamba-dga salt + VaporGrip	2.9SL	66.00 gal	22 fl oz	33 fl oz	44 fl oz	11.30	17.00	22.70
Fierce ^{14,15}	Valent	-	flumioxazin + pyroxasulfone	33.5 + 42.5WDG	6.90 oz	3 oz	3.33 oz	3.75 oz	20.70	22.90	25.80
Fierce MTZ ^{14,15,5}	Valent	-	flumioxazin&pyroxasulfone+metri	0.5+0.64+1.5 SC	220.30 gal	1 pt	1.25 pt	1.5 pt	27.50	34.40	41.30
Firestorm ²²	UPL	Paraquat	paraquat-dichloride	3SL	35.00 gal	2 pt	3 pt	4 pt	8.80	13.10	17.50
FirstRate ²	Corteva	-	cloransulam-methyl	84WDG	41.80 oz	0.3 oz	0.6 oz	0.75	12.50	25.10	31.30
Flexstar ¹⁴	Syngenta	-	fomesafen-Na salt & adjuvants	1.88EC	65.10 gal	0.5 pt	-	0.75 pt	4.10	-	6.10
Flexstar GT 3.5 ^{14,9}	Syngenta	-	fomesafen & glyt & adjuvants	0.56 + 2.26SL	36.70 gal	1.75 pt	-	2.68 pt	8.00	-	12.30
Foma 1.88 ¹⁴	Drexel	Flexstar	fomesafen-Na salt & adjuvants	1.88EC	33.00 gal	0.5 pt	-	0.75 pt	2.10	-	3.10
Foma 2.0 ¹⁴	Drexel	Reflex	fomesafen-Na salt	2EC	41.50 gal	0.5 pt	-	0.75 pt	2.60	-	3.90
FomAsate ^{14,9}	Drexel	Flexstr GT	fomesafen & glyt & adjuvants	0.56 + 2.26SL	25.00 gal	1.75 pt	-	2.68 pt	5.50	-	8.40
Fomesafen1.88 ¹⁴	Willowood	Flexstar	fomesafen-Na salt & adjuvants	1.88EC	39.00 gal	0.5 pt	-	0.75 pt	2.40	-	3.70

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Forefront HL ^{4,4}	Corteva	-	aminopyralid-3ipNH ₄ & 2,4-D	0.41 + 3.33EC	60.00 gal	1.2 pt	1.5 pt	2.1 pt	9.00	11.30	15.80
Framework ³	Winfield	Prowl	pendimethalin	3.3EC	31.50 gal	2.4 pt	3 pt	3.64 pt	9.40	11.80	14.30
Frequency ²⁷	BASF	Impact	topramezone	2.8SC	860.00 gal	1 oz	2 oz	4 oz	6.70	13.40	26.90
Full Deck ^{4,4,4}	Helena	-	MCPA & fluroxypyr & clopyralid	2.48+ 0.66 + 0.57SL	95.00 gal	1 pt	1.25 pt	1.5 pt	11.90	14.80	17.80
FulTime NXT ^{15,5}	Corteva	-	acetochlor & atrazine	2.4 ME + 1.6L	42.20 gal	2.5 qt	2.7 qt	3 qt	26.40	28.50	31.60
Fusilade DX ¹	Syngenta	-	fluazifop-P butyl	2EC	136.90 gal	6 fl oz	10 fl oz	12 fl oz	6.40	10.70	12.80
Garlon 4 Ultra ⁴	Corteva	-	triclopyr-ester	4EC	103.00 gal	1 qt	2 qt	4 qt	26	52	104
Glory ⁵	ADAMA	Sencor	metribuzin	75DF	14.30 lb	0.25 lb	0.33 lb	0.5 lb	3.60	4.70	7.10
Glyphogan/Plus ⁹	ADAMA	Roundup	glyphosate-ipa salt	3SL	18.00 gal	2 pt	3 pt	4 pt	4.50	6.80	9.00
GlyStar 5Extra ⁹	Albaugh	Rodeo	glyphosate-ipa salt	4SL	25.00 gal	24 fl oz	36 fl oz	48 fl oz	4.70	7.00	9.40
GlyStar Gold ⁹	Albaugh	Roundup	glyphosate-ipa salt	3SL	18.00 gal	2 pt	3 pt	4 pt	4.50	6.80	9.00
GlyStar Original ⁹	Albaugh	Roundup	glyphosate-ipa salt	3SL	18.00 gal	2 pt	3 pt	4 pt	4.50	6.80	9.00
GlyStar Plus ⁹	Albaugh	Roundup	glyphosate-ipa salt	3SL	15.00 gal	2 pt	3 pt	4 pt	3.80	5.60	7.50
Goal ¹⁴	Corteva	Collide	oxyfluorfen	2EC	56.00 gal	4 pt	6 pt	8 pt	28.00	42.00	56.00
GoldSky ^{2,2,4}	Corteva	-	pyroxsulam&florasulam&flurox	0.11+0.018+0.71OD	145.60 gal	1 pt	-	1 pt	18.20	-	18.20
Gramoxone SL 3.0 ²²	Syngenta	Paraquat	paraquat-dichloride	3SL	17.70 gal	1.3 pt	2 pt	2.7 pt	2.90	4.40	6.00
Graslan L ^{4,4}	Corteva	Grazon	picloram-3ipa & 2,4-D-choline	0.81 + 3SL	39.00 gal	1.5 pt	2 pt	2.5 pt	7.30	9.80	12.20
GrazonNext ^{4,4}	Corteva	-	aminopyralid-3ipa + 2,4-D-3ipa	0.41 + 3.33SL	57.30 gal	1.5 pt	2 pt	2.6 pt	10.70	14.30	18.60
Grazon P+D ^{4,4}	Corteva	Graslan	picloram-3ipa & 2,4-D-3ipa	0.54 + 2SL	35.00 gal	2 qt	3 qt	4 qt	17.50	26.30	35.00
GunSlinger ^{4,4}	Albaugh	Grazon	picloram-3ipamine&2,4-D-3ipa	0.54 + 2 S	21.90 gal	2 qt	3 qt	4 qt	11.00	16.40	21.90
Habitat ²	BASF	Arsenal	imazapyr-ipa salt	2SL	130.00 gal	1 qt	2 qt	3 qt	32.50	65.00	97.50
Halex GT ^{27,9,15}	Syngenta	-	mesotrione & glyt-K & S-meto	4.39 SC (1:10:10)	47.20 gal	3 pt	3.6 pt	4 pt	17.70	21.20	23.60
Halomax ²	Aceto	Permit	halosulfuron-methyl	75DF	22.00 oz	0.67 oz	1 oz	1.33 oz	14.70	22.00	29.30
Harmony SG ²	FMC	-	thifensulfuron-methyl	50SG	36.00 oz	0.3 oz	0.45 oz	0.7 oz	10.80	16.20	25.20
Harness ¹⁵	Bayer	-	acetochlor & furilazole safener	7EC	76.20 gal	1.25 pt	1.75 pt	2.25 pt	11.90	16.70	21.40
Harness Max ^{15,27}	Bayer	-	acet & meso & furilazole safener	3.52 + 0.33EC	58.70 gal	40 fl oz	55 fl oz	88 fl oz	18.30	25.20	40.40
Harness Xtra ^{15,5}	Bayer	-	acet & furilazole & atrazine	4.3 + 1.7F	51.20 gal	1.2 qt	1.5 qt	1.8 qt	15.40	19.20	23.10
Harness Xtra 5.6L ^{15,5}	Bayer	-	acet & furilazole & atrazine	3.1 + 2.5F	55.40 gal	1.5 qt	1.7 qt	2.3 qt	20.80	23.60	31.90
Hat Trick ^{4,4,4}	Loveland	-	clop-mea&fluroxy-mhe&MCPAe	0.51 + 0.51 + 1.8EC	54.50 gal	1 pt	1.5 pt	2 pt	6.80	10.20	13.60
Helmquat ²²	Helm Agro	Gramoxon	paraquat-dichloride	3SL	26.00 gal	0.67 pt	1 pt	1.33 pt	4.20	6.50	8.80
Herbivore ²	Winfield	Permit	halosulfuron-methyl	75DF	16.80 oz	0.67 oz	1 oz	1.33 oz	11.30	16.80	22.40
Hornet ^{2,4}	Corteva	-	flumetsulam & clopyralid-K salt	18.5 + 60WDG	4.60 oz	2 oz	3 oz	4 oz	9.10	13.70	18.20
Huskie ^{6,27}	Bayer	-	brom & pyrasulfotole & mefenpyr	1.75 + 0.31EC	99.90 gal	11 fl oz	12.8 fl oz	13.7 fl oz	8.60	10.00	10.70
Huskie Complete ^{6,27,2}	Bayer	-	brom&pyrasulf&thiencarb&mfnp	1.46+0.26+0.042OD	174.40 gal	13.7 fl oz	-	13.7 fl oz	18.70	-	18.70
Huskie FX ^{6,27,4}	Bayer	-	brom&pyrasulf&fluroxy&mefenpyr	1.44 + 0.26 + 0.60EC	119.50 gal	13.5 fl oz	-	18 fl oz	12.60	-	16.80
Hydrothol 191	UPL	Herb. 273	Endothall	2G	4.50 lb	-	-	-	-	-	-
Hyvar X5	Bayer	-	bromacil	80WP	22.00 lb	3 lb	7 lb	15 lb	66	154	330
Impact ²⁷	AMVAC	Armezon	topramezone	2.8SC	21.80 fl oz	0.33 fl oz	0.5 fl oz	0.75 fl oz	7.20	10.90	16.30
Impact Core ^{15,27}	AMVAC	-	acetochlor + topramezone	7.08 + 0.071SC	-	20 fl oz	30 fl oz	40 fl oz	-	-	-
ImpactZ ^{27,5}	AMVAC	-	topramezone & atrazine	0.26 & 4SC	179.20 gal	8 fl oz	-	10.7 fl oz	11.20	-	15.00
Impose ²	ADAMA	Plateau	imazapic-NH ₄ salt	2SL	1.80 fl oz	4 fl oz	8 fl oz	12 fl oz	7.10	14.20	21.40
Incinerate ²⁷	Winfield	Callisto	mesotrione	4SE	139.20 gal	2 fl oz	2.5 fl oz	3 fl oz	2.20	2.70	3.30
Instigate ^{2,27}	Corteva	Realm Q	rimsulfuron & mesotrione	4.17 + 41.67WDG	3.20 oz	5.25 oz	-	7 oz	16.50	-	22.10
Intensity ¹	Loveland	Select	clethodim	2EC	61.00 gal	4 fl oz	6 fl oz	8 fl oz	1.90	2.90	3.80
Intensity One ¹	Loveland	Select Max	clethodim	1EC	71.00 gal	6 fl oz	8 fl oz	12 fl oz	3.30	4.40	6.70
Interline ¹⁰	UPL	Liberty	glufosinate-NH ₄ salt	2.34SL	40.00 gal	22 fl oz	29 fl oz	36 fl oz	6.90	9.10	11.30
Karmex ⁵	ADAMA	Diuron	diuron	80XP	4.80 lb	2 lb	6 lb	8 lb	9.70	29.00	38.70
Keystone LA NXT ^{15,5}	Corteva	Harness	acetochlor & atrazine	4 + 1.5L	65.40 gal	1.33 qt	1.5 qt	1.8 qt	21.80	24.50	29.40
Kochiavore ^{4,6,4}	Winfield	-	2,4-De&bromox-e&fluroxypyr-e	1.67&1.67&0.67EC	69.00 gal	1 pt	-	1.5 pt	8.60	-	12.90
Krovar ^{16,5}	Bayer	-	bromacil & diuron	40 + 40DF	10.20 lb	6 lb	12 lb	16 lb	61	122	163
Kyber ^{14,5,15}	Corteva	-	flumiox & metrib & pyroxsulfone	0.5 + 1.5 + 0.64SC	216.00 gal	1 pt	-	1.5 pt	27.00	-	41.00
Landmaster BW ^{9,4}	Albaugh	-	glyphosate-ipa & 2,4-D-ipa salt	0.9 + 1.5SL	16.00 gal	27 fl oz	40 fl oz	54 fl oz	3.40	5.00	6.80
Latigo ^{4,4}	Helena	Weedmstr	dicamba-acid & 2,4-D-acid	1.8 + 2.4 SL	74.00 gal	0.33 pt	0.67 pt	1 pt	3.10	6.20	9.30
Latir ^{14,2}	ADAMA	-	flumioxazin & imazethapyr	31.5 + 23.5WDG	-	3.2 oz	3.8 oz	4.25 oz	-	-	-
Laudis ²⁷	Bayer	-	tembotrione & isoxadifen safener	3.5 + 1.75SC	3.60 fl oz	3 fl oz	-	3 fl oz	10.80	-	10.80
Liberty 280 ¹⁰	BASF	-	glufosinate-NH ₄ salt	2.34SL	44.90 gal	29 fl oz	32 fl oz	43 fl oz	10.20	11.20	15.10
Linex ⁵	TKI	-	linuron	4L	94.40 gal	8 fl oz	12 fl oz	16 fl oz	5.90	8.80	11.80

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						Low	Med	High	Low	Med	High
Lorox ⁵	TKI	-	linuron	50DF	25.80 lb	1 lb	2 lb	3 lb	25.80	51.60	77.40
Lumax EZ ^{5,27,15}	Syngenta	-	atrazine & mesotrione & S-metol	0.94 + 0.25 + 2.5SE	65.50 gal	3 pt	4 pt	5 pt	24.60	32.70	40.90
Luxxur A&B ^{2,2}	Bayer	-	tribenuron + thiencarb&mfnpyr	50SG+0.083 co-pack	1,300/case	80A/case			-	16.30	-
Mad Dog/Plus ⁹	Loveland	Roundup	glyphosate-ipa salt	3SL	13.00 gal	2 pt	3 pt	4 pt	3.30	4.90	6.50
Maestro 2EC ⁶	Nufarm	Buctril	bromoxynil-ester	2EC	47.00 gal	1 pt	1.5 pt	2 pt	5.90	8.80	11.80
Maestro 4EC ⁶	Nufarm	Buctril	bromoxynil-ester	4EC	82.10 gal	0.5 pt	0.75 pt	1 pt	5.10	7.70	10.30
Maestro Adv. ^{6,4}	Nufarm	Bron. Adv.	bromoxynil-ester & MCPA-ester	2.5 + 2.5EC	62.40 gal	0.8 pt	1.2 pt	1.6 pt	6.20	9.40	12.50
Maestro D ^{6,4}	Nufarm	-	bromoxynil-ester & 2,4-D-ester	2 + 1.9EC	51.30 gal	0.75 pt	1.33 pt	2 pt	4.80	8.50	12.80
Maestro MA ^{6,4}	Nufarm	Bronate	bromoxynil-ester & MCPA-ester	2 + 2EC	51.90 gal	1 pt	1.5 pt	2 pt	6.50	9.70	13.00
Makaze ⁹	Loveland	Roundup	glyphosate-ipa salt	3SL	14.30 gal	2 pt	3 pt	4 pt	3.60	5.30	7.10
Makaze Yield Pro ⁹	Loveland	-	glyphosate-ipa salt+IBA+cytokinin	3+0.005+0.0009SL	24.00 gal	2 pt	3 pt	4 pt	6.00	9.00	12.00
Marvel ^{14,14}	FMC	-	fomesafen & fluthiacet	2.88 + 0.12SC	165.70 gal	5 fl oz	6 fl oz	7 fl oz	6.50	7.80	9.10
Matador ^{15,5,2}	Loveland	-	metochlr & metrib & imazethapyr	4 + 0.56 + 0.13SL	50.00 gal	2 pt	3 pt	4 pt	12.50	18.80	25.00
Matador S ^{15,5,2}	Loveland	-	metochlr & metrib & imazethapyr	3.38 + 0.75 + 0.17SL	60.00 gal	1.9 pt	-	2.4 pt	14.30	-	18.00
Matrix ²	Corteva	-	rimsulfuron	25DF	14.60 oz	1 oz	-	1.5 oz	14.60	-	21.90
Mauler ⁵	Valent	Sencor	metribuzin	4F	141.60 gal	6 fl oz	9 fl oz	12 fl oz	6.60	10.00	13.30
MCPA amine ⁴	Severl	-	MCPA-amine	4SL	22.90 gal	0.4 pt	1 pt	2 pt	1.10	2.90	5.70
MCPA ester ⁴	Severl	-	MCPA-ester	4EC	22.70 gal	0.5 pt	1 pt	2 pt	1.40	2.80	5.70
Mes-O-sate ^{27,9,15}	Drexel	Halex GT	mesotrione & glyt-K & S-meto	4.39 SC (1:10:10)	40.00 gal	3.6 pt	-	4 pt	18.00	-	20.00
MesoTryOne ²⁷	Drexel	Callisto	mesotrione	4SE	160.00 gal	2 fl oz	2.5 fl oz	3 fl oz	2.50	3.10	3.80
Me-Too-Lachlor ¹⁵	Drexel	Dual Mag.	metolachlor	8EC	40.00 gal	1.33 pt	1.67 pt	2 pt	6.70	8.40	10.00
Me-Too-Lachlor II ¹⁵	Drexel	Dual II M	metolachlor & benoxacor safen	7.8EC	40.00 gal	1.33 pt	1.67 pt	2 pt	6.70	8.40	10.00
Method ⁴	Bayer	-	aminocyclopyrachlor-K	2SL	4.80 fl oz	4 fl oz	8 fl oz	12 fl oz	19.00	38.00	57.00
Metribuzin ⁵	ADAMA	Sencor	metribuzin	75DF	23.60 lb	0.25 lb	0.33 lb	0.5 lb	5.90	7.80	11.80
Milestone / VM ⁴	Corteva	-	aminopyralid-3ipNH ₄ salt	2SL	328.40 gal	3 fl oz	5 fl oz	7 fl oz	7.70	12.80	18.00
Moxy ⁶	Winfield	Buctril	bromoxynil-ester	2EC	55.90 gal	1 pt	1.5 pt	2 pt	7.00	10.50	14.00
NextStep NG ¹	UPL	Discover	clodinafop & oil adjuvant	0.5EC	163.50 gal	12.8 floz	14.5 floz	16 fl oz	16.40	18.50	20.40
Nimble ^{2,2}	FMC	Harm Extr	thifensulfuron & tribenuron 2:1	50 + 25DF	6.50 oz	0.15 oz	0.3 oz	0.6 oz	1.00	2.00	3.90
Nortron SC ¹⁶	Bayer	-	ethofumesate	4EC	100.60 gal	6 pt	7 pt	7.5 pt	75.40	88.00	94.30
Olympus ²	Bayer	-	propoxycarbazone-Na salt	70WDG	14.40 oz	0.4 oz	0.5 oz	0.6 oz	5.70	7.20	8.60
OpenSky ^{2,4}	Corteva	-	pyroxulam&fluroxypr	0.107+0.95SE	136.70 gal	1 pt	-	1.25 pt	17.10	-	21.40
Orion ^{2,4}	Syngenta	-	florasulam & MCPA-ehe	0.033 + 2.34EC	375.00 case	17 fl oz - 40A/case			-	9.40	-
Osprey ²	Bayer	Silverado	mesosulfuron-methyl	4.5WDG	3.60 oz	3.2 oz	4 oz	4.75 oz	11.60	14.50	17.20
Oust XP ²	Bayer	-	sulfometuron-methyl	75XP	7.00 oz	2 oz	6 oz	8 oz	14.00	42.00	56.00
Oust Extra ^{2,2}	Bayer	-	sulfometuron & metsulfuron	56.25 + 15DF	6.00 oz	3 oz	4 oz	5 oz	18.00	24.00	30.00
Outflank ¹⁴	ADAMA	Valor	flumioxazin	51WDG	6.00 oz	1.5 oz	2 oz	3 oz	9.00	12.00	18.00
Outlaw ^{4,4}	Helena	Weedmstr	2,4-D-ehe & dicamba-acid	1.45 + 1.09SL	55.00 gal	1.5 pt	1.75 pt	2.75 pt	10.30	12.00	18.90
Outlook ¹⁵	BASF	-	dimethenamid-P	6EC	143.20 gal	10 fl oz	14 fl oz	18 fl oz	11.20	15.70	20.10
Outrider ²	Valent	Maverick	sulfosulfuron	75DF	15.70 oz	0.33 oz	0.50 oz	0.67 oz	5.20	7.90	10.50
Overdrive ^{4,19}	BASF	Distinct	dicamba-Na & diflufenzopyr-Na	50 + 20WDG	2.80 oz	4 oz	6 oz	8 oz	11.20	16.80	22.40
Palace ^{15,27}	Tenkoz	Zemax	S-metolachlor & mesotrione	3.34 + 0.33SC	52.50 gal	1.6 qt	2 qt	2.4 qt	21.00	26.30	31.50
Panoflex ^{2,2}	Corteva	-	thifensulfuron & tribenuron 1:4	10 + 40SG	9.50 oz	0.3 oz	0.45 oz	0.6 oz	2.80	4.30	5.70
Panther SC ¹⁴	Nufarm	Valor	flumioxazin	4SC	182.00 gal	1.5 fl oz	2 fl oz	3 fl oz	17.10	-	17.10
Panther Pro ^{14,5,2}	Nufarm		flumioxazin&metri&imazethapyr	0.67 + 3 + 0.56SC	320.00 gal	12 fl oz	-	12 fl oz	3.80	5.00	7.50
Parallel ¹⁵	ADAMA	Dual II	metolachlor & safener	7.8EC	27.50 gal	1.33 pt	1.67 pt	2 pt	4.60	5.70	6.90
Parallel PCS ¹⁵	ADAMA	Dual	metolachlor	8EC	25.80 gal	1.33 pt	1.67 pt	2 pt	4.30	5.40	6.50
Paraquat ²²	Willowood	Gramoxon	paraquat-dichloride	3SL	25.50 gal	0.67 pt	1 pt	1.33 pt	2.10	3.20	4.20
Parazone ²²	AMVAC	Gramoxon	paraquat-dichloride	3SL	25.50 gal	0.67 pt	1 pt	1.33 pt	2.10	3.20	4.20
Parity ¹	Tenkoz	Puma	fenoxaprop-P ethyl	1EC	167.50 gal	0.33 pt	0.4 pt	0.67 pt	6.90	8.40	14.00
Pathfinder II ⁴	Corteva	Garlon	triclopyr-acid/bee	0.75EC	48.30 gal	2.7 gal	8 gal	10.7 gal	130	386	517
Patriot ²	Nufarm	Escort	metsulfuron-methyl	60DF	3.30 oz	0.33 oz	1 oz	2 oz	1.10	3.30	6.50
Peak ²	Syngenta	-	prosulfuron	57DF	16.80 oz	0.25 oz	0.38 oz	0.5 oz	4.20	6.40	8.40
PerfectMatch ^{2,4,4}	Corteva	-	pyroxulam & clopyr & fluroxypr	1.66SE	139.40 gal	1 pt	-	1 pt	17.40	-	17.40
Permit ²	Gowan	-	halosulfuron-methyl	75DF	22.40 oz	0.67 oz	1 oz	1.33 oz	15.00	22.40	29.80
Perpetuo ^{14,15}	Valent	-	flumiclorac + pyroxasulfone	2.3 SC	-	6 fl oz	8 fl oz	10 fl oz	-	-	-
Perspective ^{4,2}	Bayer	-	aminocyclopyrachlor+chlorsulf	39.5 + 15.8DF	6.80 oz	3 oz	4.75 oz	8 oz	20.50	32.40	54.60
Phoenix ¹⁴	Valent	-	lactofen & adjuvants	2EC	215.70 gal	8 fl oz	10 fl oz	12.5 fl oz	13.50	16.90	21.10

Product ^{Site of action}	Company	Brand Equiv.	Active ingredients	Formulation	\$/Unit	Product/A			Cost \$/A		
						Low	Med	High	Low	Med	High
Pin-Dee ³	Drexel	Prowl EC	pendimethalin	3.3EC	34.50 gal	2.4pt	3 pt	3.6 pt	10.30	12.90	15.50
Pixxaro EC ^{4,4}	Corteva	-	Halauxifen-methyl + fluroxypyr	0.1 + 2.33EC	134.40 gal	-	6 fl oz	-	-	6.30	-
Plateau ²	BASF	-	imazapic-NH ₄ salt	2SL	164.80 gal	4 fl oz	8 fl oz	12 fl oz	5.10	10.30	15.40
Plotter ²	Rotam	Ally	metsulfuron-methyl (cropland)	60DF	5.80 oz	0.05 oz	0.1 oz	0.3 oz	0.30	0.60	1.70
Poast ¹	BASF	-	sethoxydim	1.5EC	103.40 gal	0.5 pt	1 pt	1.5 pt	6.50	12.90	19.40
Portfolio4F ¹⁴	Wilbur-Ellis	Spartan	sulfentrazone	4L	555.00 gal	3 fl oz	4.5 fl oz	6 fl oz	13.00	19.50	26.00
PowerFlex HL ²	Corteva	-	pyroxsulam+cloquintocet safener	13.1WDG	6.60 oz	2 oz	-	2 oz	13.10	-	13.10
Pramitol EC ⁵	Severel	-	prometon	25EC	36.50 gal	5 gal	7.5 gal	10 gal	183	274	365
Pramitol 5S ⁵	Severel	-	prometon	5PS	3.00 lb	150 lb	200 lb	400 lb	454	605	1210
Prefix ^{15,14}	Syngenta	-	S-metolachlor & fomesafen	4.34 + 0.95EC	52.60 gal	1 pt	1.5 pt	2 pt	6.60	9.90	13.10
Pre-Pare ²	UPL	Everest	flucarbazone-Na salt	70WDG	21.50 oz	0.3 oz	-	0.3 oz	6.40	-	6.40
Prequel ^{2,27}	Corteva	-	rimsulfuron & isoxaflutole	15 + 30SG	7.90 oz	1.66 oz	2 oz	2.5 oz	13.10	15.80	19.80
Presidual ^{15,5}	Winfield	Boundary	S-metolachlor & metribuzin	5.25 + 1.25L	70.00 gal	1.2 pt	1.6 pt	2.45 pt	10.50	14.00	21.40
Primero ²	Rotam	Accent	nicosulfuron	75DF	10.00 oz	0.33 oz	0.5 oz	0.67 oz	3.30	5.00	6.70
Princep 4L ⁵	Syngenta	-	simazine	4L	22.80 gal	2 qt	3 qt	4 qt	11.40	17.10	22.80
Princep Caliber 90 ⁵	Syngenta	-	simazine	90DF	5.20 lb	1.8 lb	3 lb	4.4 lb	9.30	15.50	22.80
Prowl H2O ³	BASF	-	pendimethalin	3.8ACS	46.20 gal	2.1 pt	2.6 pt	3 pt	12.10	15.00	17.30
Pruvin ²	ADAMA	Resolve	rimsulfuron	25SG	8.80 oz	0.75 oz	-	1 oz	6.60	-	8.80
Purestand ²	Nufarm	Ally	metsulfuron-methyl	60DF	5.80 oz	0.05 oz	0.1 oz	0.3 oz	0.30	0.60	1.70
Pursuit ²	BASF	-	imazethapyr-NH ₄ salt	2AS	430.30 gal	2 fl oz	2.5 fl oz	3 fl oz	6.70	8.40	10.10
Python ²	Corteva	-	flumetsulam	80WDG	15.00 oz	0.8 oz	1 oz	1.33 oz	12.00	15.00	20.00
Quelex ^{4,2}	Corteva	-	halauxifen & florasulam	0.1 + 0.1WDG	119.70 lb	0.75 oz	-	0.75 oz	5.60	-	5.60
Quik-Quat ²²	Drexel	Paraquat	paraquat-dichloride	3SL	35.00 gal	0.67 pt	1 pt	1.33 pt	2.90	4.40	5.80
Range Star ^{4,4}	Albaugh	Weedmstr	2,4-D-dea & dicamba-dea salt	2.87 + 1SL	29.60 gal	1 pt	2 pt	4 pt	3.70	7.40	14.80
Rapport BrdSpec ^{2,2}	Nufarm	Affinity BS	thifensulfuron & tribenuron 1:1	25 + 25DF	7.60 oz	0.4 oz	0.6 oz	1 oz	3.00	4.50	7.60
Rapport TankMix ^{2,2}	Nufarm	Affinity TM	thifensulfuron & tribenuron 4:1	40 + 10DF	5.70 oz	0.6 oz	0.75 oz	1 oz	3.40	4.30	5.70
Raptor ²	BASF	-	imazamox-NH ₄ salt	1SL	541.90 gal	3 fl oz	4 fl oz	5 fl oz	12.70	16.90	21.20
Realm Q ^{2,27}	Corteva	Instigate	rimsulfuron & meso. & isoxadifen	7.5+31.25SG	5.20 oz	4 oz	-	4 oz	20.80	-	20.80
Reflex ¹⁴	Syngenta	-	fomesafen-Na salt	2EC	54.60 gal	0.5 pt	0.75 pt	1 pt	3.40	5.10	6.80
Reglone ²²	Syngenta	-	diquat-dibromide salt	2SL	78.40 gal	1 pt	1.5 pt	2 pt	9.80	14.70	19.60
Relegate ⁴	Nufarm	Remedy	triclopyr-ester	4EC	55.00 gal	1 qt	1.5 qt	2 qt	13.80	20.60	27.50
Rely 280 ¹⁰	BASF	Liberty	glufosinate-NH ₄ salt	2.34SL	61.00 gal	48 fl oz	56 fl oz	82 fl oz	22.90	26.70	39.10
Remedy Ultra ⁴	Corteva	-	triclopyr-ester	4EC	68.10 gal	1 qt	1.5 qt	2 qt	17.00	25.50	34.10
Resicore ^{4,15,27}	Corteva	-	clopyralid & acetochlor & meso	0.19 + 2.8 + 0.3SC	60.30 gal	2.25 qt	2.5 qt	3 qt	33.90	37.70	45.20
Resolve Q ^{2,2}	Corteva	Alluvex	rimsulfuron & thifen & isoxadifen	18.4 + 4SG	9.40 oz	1 oz	-	1.25 oz	9.40	-	11.70
Resource ¹⁴	Valent	-	flumiclorac-ester	0.86SL	234.40 gal	2 fl oz	4 fl oz	6 oz	3.70	7.30	11.00
Reviton ¹⁴	Helm	-	tiafenacil	2.83SC	-	1 fl oz	2 fl oz	3 fl oz	-	-	-
Revulin Q ^{2,27}	Corteva	-	nicosulfuron & meso. & isoxadifen	14.4 + 36.8SG	5.20 oz	3.4 oz	3.7 oz	4 oz	17.70	19.30	20.90
Rifle ⁴	Loveland	Banvel	dicamba-dma salt	4SL	52.00 gal	4 fl oz	8 fl oz	16 fl oz	1.60	3.30	6.50
Rifle D ^{4,4}	Loveland	Weedmstr	2,4-D-dea & dicamba-dea salt	2.87 + 1SL	32.50 gal	0.5 pt	2 pt	4 pt	2.00	8.10	16.30
Rimfire Max ^{2,2}	Bayer	-	propoxy-Na & meso & mefenpyr	4.76 + 1.91WDG	4.70 oz	3 oz	-	3 oz	14.00	-	14.00
Ringside ¹⁴	Tenkoz	Reflex	fomesafen-Na salt	2EC	41.40 gal	0.5 pt	0.75 pt	1 pt	2.60	3.90	5.20
Rodeo ⁹	Corteva	-	glyphosate-ipa salt	4SL	30.00 gal	24 fl oz	36 fl oz	48 fl oz	5.60	8.40	11.30
Ro-Neet SB ¹⁵	Helm Agro	-	cycloate	6EC	173.00 gal	4 pt	4.5 pt	5.33 pt	87	97	115
RT 3 ⁹	Bayer	Roundup	glyphosate-K salt	4.5SL	16.70 gal	22 fl oz	32 fl oz	44 fl oz	2.90	4.20	5.70
RU PowerMax ⁹	Bayer	Roundup	glyphosate-K salt	4.5SL	20.10 gal	22 fl oz	32 fl oz	44 fl oz	3.50	5.00	6.90
RU WeatherMax ⁹	Bayer	Roundup	glyphosate-K salt	4.5SL	26.80 gal	22 fl oz	32 fl oz	44 fl oz	4.60	6.70	9.20
Rugged ⁴	Winfield	2,4-D acid	2,4-D-acid	3.49EC	32.40 gal	0.67 pt	1.33 pt	2.5 pt	2.70	5.40	10.10
Rumble ¹⁴	ADAMA	Flexstar	fomesafen-Na salt & adjuvants	1.88EC	60.00 gal	0.5 pt	0.75 pt	1 pt	3.80	5.60	7.50
Saber ⁴	Loveland	2,4-D a	2,4-D-dma salt	3.8SL	25.50 gal	0.5 pt	1 pt	2 pt	1.60	3.20	6.40
Salvo ⁴	Loveland	2,4-D e	2,4-D-ester	5EC	36.00 gal	6.4 fl oz	9.6 fl oz	12.8 fl oz	1.80	2.70	3.60
Sandea ²	Gowan	Permit	halosulfuron-methyl	75DF	41.00 oz	0.67 oz	1 oz	1.33 oz	27.50	41.00	54.50
Scorch ^{4,4,4}	Nufarm	-	2,4-D & floroxyppyr & dicamba	3 + 0.75 + 1EC	53.00 gal	1 pt	2 pt	4 pt	6.60	13.30	26.50
Scout ¹⁰	Valent	Liberty	Glufosinate-NH ₄ Salt	2.34 SL	45.00 gal	29 fl oz	32 fl oz	43 fl oz	10.20	11.30	15.10
Section ¹	Winfield	Select	clethodim	2EC	120.00 gal	4 fl oz	6 fl oz	8 fl oz	3.80	5.60	7.50
Section Three ¹	Winfield	Shadow	clethodim	3EC	103.20 gal	2.7 floz	5.33 floz	10.7 floz	2.10	4.30	8.60
Select Max ¹	Valent	-	clethodim	1EC	99.70 gal	8 fl oz	12 fl oz	16 fl oz	6.20	9.30	12.50
Sentrallas ^{2,4}	FMC	-	thifensulfuron & fluroxypyr	0.25 & 1.3OD	115.90 gal	7 fl oz	9 fl oz	14 fl oz	6.30	8.10	12.70

Product ^{Site of action}	Company	Brand Equiv.	Active ingredients	Formulation	\$/Unit	Product/A			Cost \$/A		
						Low	Med	High	Low	Med	High
Sequence ^{9,15}	Syngenta	-	glyphosate-K salt & S-metolachlor	2.25 + 3SC	40.90 gal	1.5 pt	2.5 pt	3 pt	7.70	12.80	15.30
Shadow ¹	UPL	Select	clethodim	3EC	63.80 gal	2.7 floz	5.33 floz	10.7 floz	1.30	2.70	5.30
Sharpen ¹⁴	BASF	-	saflufenacil	2.85SC	680.50 gal	1 fl oz	2 fl oz	3 fl oz	5.30	10.60	15.90
Showdown ⁹	Helena	Roundup	glyphosate-ipa & NH ₄ salt	2.7 + 0.3SL	20.00 gal	22 fl oz	32 fl oz	44 fl oz	3.40	5.00	6.90
Shredder E-99 ⁴	Winfield	-	2,4-D-beester	6.1EC	28.60 gal	0.33 pt	0.67 pt	1.33 pt	1.20	2.40	4.80
Sierra ²	Syngenta	Everest	flucarbazone-Na salt & safener	3.5SC	15.00 fl oz	0.5 fl oz	0.75 fl oz	1 fl oz	7.50	11.30	15.00
Simazine L ⁵	Severl	Princep	simazine	4L	17.00 gal	2 qt	3 qt	4 qt	8.50	12.70	17.00
Simazine DF ⁵	Severl	Princep	simazine	90DF	4.00 lb	1.8 lb	3 lb	4.4 lb	7.20	12.00	17.60
Sinate ^{27,10}	AMVAC	-	topramezone & glufosinate	0.1 + 2.47SL	-	21 fl oz	-	28 fl oz	-	-	-
Sinbar ⁵	TKI	-	terbacil	80WP	49.30 lb	0.5 lb	2 lb	4 lb	25	100	200
Sinister ¹⁴	Helena	Reflex	fomesafen-acid	2.87SL	132.30 gal	0.52 pt	-	0.52 pt	8.60	-	8.60
Smack Down ^{15,4,2}	Loveland	SureStart	aceto&clopyp&flumet&dichlormid	3.75+0.29+0.12SC	84.50 gal	1.5 pt	2 pt	3 pt	15.80	21.10	31.70
Solida ²	FMC	Matrix	rimsulfuron	25DF	18.00 oz	1 oz	-	1.5 oz	18.00	-	27.00
Solstice ^{27,14}	FMC	-	mesotrione & fluthiacet	3.784 + 0.216SC	379.00 gal	2.5 fl oz	-	3 fl oz	7.40	-	8.90
Sonalan HFP ³	Gowan	-	ethalfuralin	3EC	44.50 gal	1.5 pt	3 pt	4.5 pt	8.40	16.70	25.10
Sonalan 10G ³	Gowan	-	ethalfuralin	10G	2.70 lb	6 lb	11.5 lb	17 lb	16.30	31.20	46.10
Sonic ^{2,14}	Corteva	Authrty 1st	cloransulam & sulfentrazone	7.9 + 62.1WDG	4.00 oz	4 oz	6 oz	8 oz	15.80	23.70	31.60
Spartan ¹⁴	FMC	-	sulfentrazone	4L	191.30 gal	3 fl oz	4.5 fl oz	6 fl oz	4.50	6.70	9.00
Spartan Charge ^{14,14}	FMC	-	carfentrazone & sulfentrazone	0.35 + 3.15SE	250.50 gal	3.75 fl oz	4.5 fl oz	5.75 fl oz	7.30	8.80	11.30
Spartan Elite ^{15,14}	FMC	BroadAxe	S-metolachlor & sulfentrazone	6.3 + 0.7EC	106.30 gal	20 fl oz	25 fl oz	32 fl oz	16.60	20.80	26.60
Spike ⁵	Corteva	-	tebuthiuron	80DF	22.10 lb	2.5 lb	3.75 lb	5 lb	55	83	111
SpitFire ^{4,4}	Nufarm	-	dicamba & 2,4-D	0.5 + 3.07SL	26.80 gal	1 pt	2 pt	4 pt	3.30	6.70	13.40
Spur ⁴	Albaugh	Stinger	clopypalid-monoeca salt	3SL	185.00 gal	1.3 fl oz	2.6 fl oz	0.25 pt	1.90	3.80	5.80
Stalker ²	BASF	Arsenal	imazapyr-ipa salt	2SL	300.00 gal	48 fl oz	2 qt	3 qt	113	150	225
Starane Flex ^{2,4}	Corteva	-	florasulam & fluroxypyr	0.042 + 0.833EC	65.60 gal	13.5 fl oz	-	13.5 fl oz	6.90	-	6.90
Starane NXT ^{6,4}	Corteva	-	bromoxynil & fluroxypyr-ester	2.33 + 0.583EC	77.50 gal	14 fl oz	21 fl oz	27.4 fl oz	8.50	12.70	16.60
Starane Ultra ⁴	Corteva	-	fluroxypyr-ester	2.8EC	183.50 gal	0.25 pt	0.35 pt	0.54 pt	5.70	8.00	12.40
Status ^{4,19}	BASF	-	dic-Na&diflufenzpr-Na&isoxadifen	40 + 16WDG	3.90 oz	5 oz	7.5 oz	10 oz	19.30	28.90	38.50
Streamline ^{4,2}	Bayer	-	aminocyclopyrachlor + metsulf	39.5 + 12.6DF	7.00 oz	4.75 oz	7.5 oz	9.5 oz	33.30	52.50	66.50
Stealth ³	Loveland	Prowl	pendimethalin	3.3EC	37.20 gal	2.4 pt	3 pt	3.64 pt	11.20	14.00	16.90
Sterling Blue ⁴	Winfield	Clarity	dicamba-dga salt	4SL	51.00 gal	4 fl oz	8 fl oz	16 fl oz	1.60	3.20	6.40
Stinger ⁴	Corteva	Stinger	clopypalid-monoeca salt	3SL	329.40 gal	1.3 fl oz	2.6 fl oz	0.25 pt	3.30	6.70	10.30
Storm ^{14,6}	UPL	-	acifluorfen & bentazon	1.33 + 2.67SL	86.70 gal	1 pt	1.5 pt	2 pt	10.80	16.30	21.70
Strut ⁴	Loveland	Clarity	dicamba-dga salt	4SL	52.00 gal	4 fl oz	8 fl oz	16 fl oz	1.60	3.30	6.50
Supremacy ^{4,2,2}	UPL	-	fluroxypyr & thifen & tribenuron	25 + 4.5 + 1.5WDG	1.80 oz	4 oz	5 oz	6 oz	7.00	8.80	10.50
SureStart II ^{15,4,2}	Corteva	-	aceto&clopyp&flumet&dichlormid	3.75+0.29+0.12SC	65.60 gal	1.5 pt	2 pt	3 pt	12.30	16.40	24.60
Surflan ³	UPL	-	oryzalin	4EC	52.00 gal	2 qt	3 qt	4 qt	26.00	39.00	52.00
Surpass NXT ¹⁵	Corteva	-	acetochlor & dichlormid safener	6.4EC	104.40 gal	1.5 pt	2 pt	2.25 pt	19.60	26.10	29.40
Surveil ^{14,2}	Corteva	Gangster	flumioxazin & cloransulm	36 + 12WDG	97.80 lb	2.1 oz	2.8 oz	4.2 oz	12.80	17.10	25.70
Sword ⁴	Loveland	-	MCPA ester	5.2EC	35.30 gal	3 fl oz	1 pt	2 pt	0.80	4.40	8.80
Tacoma ¹	Winfield	Puma	fenoxaprop-P ethyl	1EC	151.00 gal	0.33 pt	0.4 pt	0.67 pt	6.20	7.60	12.60
Tailwind ^{15,5}	ADAMA	Boundary	S-metolachlor & metribuzin	5.25 + 1.25L	75.00 gal	1.2 pt	1.6 pt	2.45 pt	11.30	15.00	23.00
Talinor ^{6,27}	Syngenta	-	bromoxynil & bicyclopyrone	1.77EC	69.20 gal	13.7 fl oz	-	18.2 fl oz	7.40	-	9.80
Tapout ¹	Helena	Select	clethodim	1EC	100.00 gal	4 fl oz	6 fl oz	8 fl oz	3.10	4.70	6.30
Targa ¹	Gowan	Assure II	quizalofop-ethyl	0.88EC	95.00 gal	7 fl oz	8 fl oz	10 fl oz	5.20	5.90	7.40
Tavium ^{4,15}	Syngenta	-	Dicamba-dga + VaporGrip + S-metolachlor	3.38 CS	46.80 gal	-	56.5 fl oz	-	20.70	20.70	20.70
Teammate ²	Corteva	-	pyroxsulam & safener	21.5WDG	205.00 lb	1 oz	-	1 oz	12.80	-	12.80
Thistrol ⁴	Nufarm	-	MCPB	2EC	52.80 gal	2 pt	4 pt	6 pt	13.20	26.40	39.60
Thunder ²	Albaugh	Pursuit	imazethapyr-NH ₄ salt	2AS	330.00 gal	2 fl oz	2.5 fl oz	3 fl oz	5.20	6.40	7.70
Thunder Master ^{2,9}	Albaugh	Extreme	imazethapyr-acid & glyph-ipa salt	0.17 + 2SL	21.50 gal	1.5 pt	2.25 pt	3 pt	4.00	6.00	8.10
Top Gun ¹⁴	Loveland	Reflex	fomesafen-Na salt	2EC	45.00 gal	0.5 pt	0.75 pt	1 pt	2.80	4.20	5.60
Tordon 22K ⁴	Corteva	-	picloram-K salt	2SL	62.70 gal	1 pt	2 pt	4 pt	7.80	15.70	31.40
Torment ^{14,2}	ADAMA	-	fomesafen & imazethapyr	2 + 0.5	104.80 gal	0.75 pt	-	1 pt	9.80	-	13.10
Tough ⁶	Belchim	-	pyridate	5EC	229.00 gal	1.5 pt	-	1.5 pt	42.90	-	42.90
Transline ⁴	Corteva	Stinger	clopypalid-monea salt	3SL	193.30 gal	0.67 pt	1 pt	1.33 pt	16.20	24.20	32.10
Travallas ^{2,2,4}	FMC	-	metsulfuron & thifen & fluroxypyr	0.025&0.25&1.3OD	1.80 fl oz	7 fl oz	-	7 fl oz	12.50	-	12.50
Treaty ²	Nufarm	Harmony	thifensulfuron-methyl	75DF	9.50 oz	1/12 oz	0.3 oz	0.6 oz	0.80	2.90	5.70
Treaty Extra ^{2,2}	Nufarm	Harm. Extr	thifensulfuron & tribenuron	50 + 25DF	8.00 oz	0.15 oz	0.3 oz	0.6 oz	1.20	2.40	4.80

Product ^{Site of action}	Company	Brand Equiv.	Active ingredients	Formulation	\$/Unit	Product/A			Cost \$/A		
						Low	Med	High	Low	Med	High
Treflan HFP ³	Gowan	-	trifluralin	4EC	20.90 gal	1 pt	2 pt	4 pt	2.60	5.20	10.50
Treflan TR-10 ³	Gowan	-	trifluralin	10G	2.20 lb	5 lb	10 lb	20 lb	10.90	21.70	43.40
TriCor 4F ⁵	UPL	Sencor	metribuzin	4F	80.10 gal	6 fl oz	8 fl oz	16 fl oz	3.80	5.00	10.00
TriCor 75DF ⁵	UPL	Sencor	metribuzin	75DF	15.10 lb	0.25 lb	0.33 lb	0.67 lb	3.80	5.00	10.10
Trifluralin EC ³	Severl	Treflan	trifluralin	4EC	23.50 gal	1 pt	2 pt	4 pt	2.90	5.90	11.80
Triflurex ³	ADAMA	Treflan	trifluralin	4EC	24.60 gal	1 pt	2 pt	4 pt	3.10	6.20	12.30
Trimec Classic ^{4,4,4}	PBI	-	2,4-D-amine & MCPP & dicamba	3.32EC	43.00 gal	3.25 pt	3.8 pt	4.33 pt	17.50	20.40	23.30
TripleFlex II ^{15,4,2}	Bayer	SureStart	aceto&clopyr&flumet&furilazole	3.75+0.38+0.12SC	81.50 gal	1.5 pt	2 pt	3 pt	15.30	20.40	30.50
Trisidual ^{15,4,2}	Winfield	SureStart	aceto&clopyr&flumet&furilazole	3.75+0.38+0.12SC	54.60 gal	1.5 pt	2 pt	3 pt	10.20	13.60	20.50
Triumph 22K ⁴	Albaugh	Tordon	picloram-K salt	2SL	45.00 gal	1 pt	2 pt	4 pt	5.60	11.30	22.50
Trooper 22 K ⁴	Nufarm	Tordon	picloram-K salt	2SL	60.00 gal	1 pt	2 pt	4 pt	7.50	15.00	30.00
Trooper Extra ^{4,4,4}	Nufarm	-	picloram-3ipa & 2,4-D-3ipa & dic	0.5 + 2 + 0.5S	39.00 gal	1 pt	2 pt	4 pt	4.90	9.80	19.50
Trooper P+D ^{4,4}	Nufarm	Grazon	picloram-3ipa & 2,4-D-3ipa salt	0.54 + 2 S	25.00 gal	2 qt	3 qt	4 qt	12.50	18.80	25.00
Trooper Pro ^{4,4}	Nufarm	Surmount	picloram-3ipa & fluroxypr-mhe	1 + 1S	56.00 gal	2 pt	3 pt	4 pt	14.00	21.00	28.00
Trump Card ^{4,4}	Helena	-	fluroxypr-ester & 2,4-D-acid	0.66 + 2.65EC	75.00 gal	1 pt	2 pt	3 pt	9.40	18.80	28.10
Truslate ^{4,4}	Nufarm	WideMatch	clopyralid-mea & fluroxypr-mhe	0.75 + 0.75EC	70.00 gal	0.75 pt	1 pt	1.33 pt	6.60	8.80	11.60
Truslate Pro ^{4,4,4}	Nufarm	-	clp-mea & flurox-mhe & MCPAe	0.5 + 0.64 + 1.75EC	50.00 gal	1 pt	1.5 pt	2 pt	6.30	9.40	12.50
Trust ³	Winfield	Treflan	trifluralin	4EC	23.60 gal	1 pt	2 pt	4 pt	2.90	5.90	11.80
Trycera ⁴	Helena	Garlon	triclopyr-acid	4EC	135.00 gal	1 qt	2 qt	4 qt	34	68	135
Tuscany SC ¹⁴	Nufarm	Valor	flumioxazin	4 SC	540.00 gal	2 fl oz	3 fl oz	4 fl oz	8.40	12.70	16.90
Ultra Blazer ¹⁴	UPL	-	acifluorfen-Na salt	2SL	54.60 gal	1 pt	1.5 pt	2 pt	6.80	10.20	13.60
Unison ⁴	Helena	Hardball	2,4-D-acid	1.74SL	40.00 gal	1 pt	1.75 pt	2.5 pt	5.00	8.80	12.50
UpBeet ²	FMC	-	triflusufluron-methyl	50DF	19.00 oz	0.25 oz	0.3 oz	0.5 oz	4.80	5.70	9.50
Valor EZ ¹⁴	Valent	-	flumioxazin	4SC	5.00 fl oz	2 fl oz	2.5 fl oz	3 fl oz	10.00	12.40	14.90
Valor SX ¹⁴	Valent	-	flumioxazin	51WDG	3.90 oz	2 oz	2.5 oz	3 oz	7.90	9.90	11.80
Vanquish ⁴	Nufarm	-	dicamba-dga salt	4SL	85.00 gal	4 fl oz	8 fl oz	16 fl oz	2.70	5.30	10.60
Varisto ^{6,2}	BASF	-	bentazon & imazamox	4 + 0.19SL	140.40 gal	16 fl oz	21 fl oz	27 fl oz	17.60	23.00	29.60
Varro ²	Bayer	-	thiencarbazone & mefenpyr	0.083OD	230.30 gal	6.85 fl oz	-	6.85 fl oz	12.30	-	12.30
Vaquero ¹	Wilbur-Ellis	Select	clethodim	2EC	107.00 gal	4 fl oz	6 fl oz	8 fl oz	3.30	5.00	6.70
Vastlan ⁴	Corteva	Garlon	triclopyr-choline	4SL	95.60 gal	1 qt	2 qt	4 qt	23.90	47.80	95.60
Velossa ⁵	Helena	Velpar	hexazinone	2L	130.00 gal	2 pt	4 pt	6 pt	32.50	65.00	97.50
Velpar ⁵	TKI	-	hexazinone	2L	95.20 gal	2 pt	4 pt	6 pt	23.80	47.60	71.40
Verdict ^{14,15}	BASF	-	saflufenacil & dimethenamid-P	0.57 + 5EC	230.40 gal	10 fl oz	13 fl oz	16 fl oz	18.00	23.40	28.80
Verdure X ²²	Helm Agro	Reglone	diquat-dibromide salt	2SL	105.00 gal	1 pt	1.5 pt	2 pt	13.10	19.70	26.30
Victory ²	Nufarm	Express	tribenuron-methyl	75DF	8.80 oz	1/8 oz	1/6 oz	1/3 oz	1.10	1.50	2.90
Vida ¹⁴	Gowan	ET	pyraflufen-ethyl	0.208EC	3.80 fl oz	0.5 fl oz	2 fl oz	5.5 fl oz	1.90	7.50	20.70
Viewpoint ^{4,2,2}	Bayer	-	aminocycpyrchr&imazapyr&met	22.8 + 31.6 + 7.3DF	5.00 oz	13 oz	16 oz	18 oz	65.00	80.00	90.00
Vise ^{15,14}	ADAMA	Prefix	S-metolachlor & fomesafen	4.34 + 0.95EC	60.00 gal	1 pt	1.5 pt	2 pt	7.50	11.30	15.00
Vision ⁴	Helena	Banvel	dicamba-acid	3.8SL	94.00 gal	4 fl oz	8 fl oz	16 fl oz	2.90	5.90	11.80
Vista XRT ⁴	Corteva	Starane	fluroxypr-ester	2.8AE	170.00 gal	6 fl oz	12 fl oz	22 fl oz	8.00	15.90	29.20
Volley ¹⁵	Tenkoz	Surpass	acetochlor & dichlormid safener	6.4EC	76.80 gal	1.5 pt	2 pt	2.25 pt	14.40	19.20	21.60
Volta ²	Rotam	Harmony	thifensulfuron-methyl	75DF	7.60 oz	1/12 oz	0.3 oz	0.6 oz	0.60	2.30	4.60
Volta Extra ^{2,2}	Rotam	Harm. Extr	thifensulfuron & tribenuron	50 + 25DF	8.00 oz	0.15 oz	0.3 oz	0.6 oz	1.20	2.40	4.80
Volunteer ¹	Tenkoz	Select	clethodim	2EC	84.70 gal	4 fl oz	6 fl oz	8 fl oz	2.60	4.00	5.30
Voucher ^{4,4}	Helena	Strn+Swd	MCPA-acid & fluroxypr-ester	2.6 + 0.64SL	65.00 gal	1 pt	2 pt	3 pt	8.10	16.30	24.40
Warrant ¹⁵	Bayer	~Degree	acetochlor (microencapsulated)	3ME water based	32.20 gal	1.25 qt	1.5 qt	2 qt	10.10	12.10	16.10
Warrant Ultra ^{15,14}	Bayer	-	acetochlor & fomesafen	2.83 + 0.64EC	46.70 gal	48 fl oz	-	48 fl oz	17.50	-	17.50
Weed Blast ^{5,5}	Loveland	-	bromacil & diuron	4 + 4G	7.00 lb	40 lb	50 lb	60 lb	280	350	420
Weedone 638 ^{4,4}	Nufarm	-	2,4-D-acid & 2,4-D-ester	2.8EC	24.30 gal	0.67 pt	2 pt	3 pt	2.00	6.10	9.10
Weedmaster ^{4,4}	Nufarm	-	2,4-D-dea & dicamba-dea	2.87 + 1SL	19.50 gal	0.5 pt	2 pt	4 pt	1.20	4.90	9.70
Weld ^{4,4,4}	Winfield	-	MCPAe & fluroxypr & clopyralid	1.75 + 0.64 + 0.5EC	58.00 gal	1 pt	1.5 pt	2 pt	7.30	10.90	14.50
Whiteout ⁴	Loveland	-	2,4-D-ehe (solventless)	5.64EC	22.00 gal	0.33 pt	0.67 pt	1.33 pt	0.90	1.80	3.70
WideARmatch ^{4,4,4}	Corteva	-	clopyralid & halauxifen & fluroxypr	0.82 + 0.04 + 1.02	80.20 gal	14 fl oz	-	14 fl oz	8.80	-	8.80
WideMatch ^{4,4}	Corteva	-	clopyralid-mea & fluroxypr-mhe	0.75 + 0.75EC	66.50 gal	0.75 pt	1 pt	1.33 pt	6.20	8.30	11.10
Wildcard ⁴	Helena	-	MCPA-ester	4EC	45.00 gal	0.5 pt	1 pt	2 pt	2.80	5.60	11.30
Wildcard Xtra ^{6,4}	Helena	Bronate	bromoxnil-ester & MCPA-ester	2 + 2EC	65.00 gal	0.75 pt	1 pt	1.5 pt	6.10	8.10	12.20
Wolverine Adv. ^{1,27,6}	Bayer	-	fenox&pyrasulf&bromox&mefenpr	0.4 & 0.13 & 1.05EC	101.80 gal	1.7 pt	-	1.7 pt	21.60	-	21.60

Product ^{Site of action}	Company	Brand Equiv.	Active ingredients	Formulation	\$/Unit	Product/A			Cost \$/A		
						Low	Med	High	Low	Med	High
XtendiMax ⁴	Bayer	Clarity	dicamba-dga salt + VaporGrip	2.9SL	54.00 gal	22 fl oz	33 fl oz	44 fl oz	9.30	13.90	18.60
Yukon ^{4,2}	Gowan	-	dicamba-Na & halosulfuron-CH3	55 + 12.5 WDG	3.80 oz	4 oz	6 oz	8 oz	15.20	22.80	30.40
Zidua ¹⁵	BASF	-	pyroxasulfone	85WDG	10.80 oz	3 oz	4 oz	5 oz	32.50	43.40	54.20
Zidua SC ¹⁵	BASF	-	pyroxasulfone	4.17SC	637.40 gal	1.75 oz	4 oz	6.5 oz	8.70	19.90	32.40
Zidua Pro ^{2,14,15}	BASF	-	pyrox&saflufenacil&imazethapyr	2.28+0.48+1.33SC	443.00 gal	4.5 fl oz	-	4.5 fl oz	15.60	-	15.60
2,4-D Products ⁴ 2,4-D amine ⁴ 2,4-D ester ⁴ LV ester ⁴	Several	-	2,4-D	3.8SL	11.60 gal	0.5 pt	2 pt	4 pt	0.70	2.90	5.80
				3.8EC	20.70 gal	0.5 pt	2 pt	4 pt	1.30	5.20	10.30
				5.7EC	17.60 gal	0.33 pt	2 pt	4 pt	0.70	4.40	8.80