CHEMICAL WEED CONTROL FOR FIELD CROPS

Fall or Spring Early Pre-Plant Herbicides

	Rate/A	See paragraph	Alfalfa	Barley	Canola/Crambe	Chick pea / Lentil	Corn	Dry bean	Field pea	Flax	Oat	Potato	Safflower	Soybean	Sugarbeet	Sunflower	HRS / Durum Wheat
			---------- months before planting (d = days) ----------														
2,4-D amine*	0.5 lb	B3	1	1	1	1	7d	1	1	1	1	1	1	15d	1	1	1
	1 lb	B3	1	1	1	1	14d	1	1	1	1	1	1	1	1	1	1
2,4-D ester*	0.5 lb	B3	1	1	1	1	7d	1	1	1	1	1	1	7d	1	1	1
	1 lb	B3	1	1	1	1	14d	1	1	1	1	1	1	1	1	1	1
Aim EC	2 fl oz	B4	0	0	N/A	0	0	0	0	0	0	0	N/A	0	N/A	0	0
dicamba*	4 fl oz	B5	12d	0	12d	12d	0	12d	12d	12d	0	12d	12d	14d	12d	12d	0
	1 pt	B5	1.5	1.5	1.5	1.5	0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
glyphosate*	0.75 - 3 lb ae	A4-7, B2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ignite 280	29 - 36 fl oz	D13	6	70d	0	6	0	6	6	6	70d	70d	6	0	0	6	70d
Paramount	0.33 lb	B7	Rotate only to wheat - Refer to Label or Crop Rotation Restrictions Table														0
paraquat* - **RUP**	2 - 4 pt 2SL	B8	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	0	0	0	0
	1.3 - 2.7 pt 3SL	B8	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	0	0	0	0
Pre-Pare	0.2 - 0.3 oz	C10	24	9	9	24	11	9	11	9	11	9	9	9	9	9	0/4
Rage D-Tech	9 - 16 fl oz	B3-4	1	1	1	1	7d	1	1	1	1	1	1	7d	1	1	1
	17 - 24 fl oz	B3-4	1	1	1	1	14d	1	1	1	1	1	1	14d	1	1	1
	25 - 32 fl oz	B3-4	1	1	1	1	14d	1	1	1	1	1	1	1	1	1	1
Sequence	2.5 - 3.5 pt	A4	4	4.5	NCS	0/12	0	0	0	NCS	4.5	NCS	NCS	0	NCS	NCS	4.5
Spartan Advance	16 - 36 fl oz	A4, E11	12	4	24	0	10	12	0	12	12	12	12	0	36	0	4
Spartan Charge	3 - 8.5 fl oz	B4, E11	12	4	24	0	4	12	0	12	12	12	12	0	36	0	4
thifensulfuron																	
Harmony 50SG	0.45 - 0.9 oz SG	C18	1.5	0	1.5	1.5	0	1.5	1.5	1.5	0	1.5	1.5	0	1.5	1.5	0
Generics 75DF*	0.3 - 0.6 oz DF	C18	1.5	0	1.5	1.5	0	1.5	1.5	1.5	0	1.5	1.5	0	1.5	1.5	0
thifensulfuron & tribenuron		C18															
4:1 ratio 50SG	0.6 - 1 oz SG	C18	1.5	0	2	1.5	14d	1.5	1.5	1.5	1.5	1.5	1.5	14d	2	1.5	0
4:1 ratio 75DF*	0.4 - 0.67 oz DF	C18	1.5	0	2	1.5	14d	1.5	1.5	1.5	1.5	1.5	1.5	14d	2	1.5	0
2:1 ratio 75DF*	0.3 - 0.67 oz DF	C18	1.5	0	2	1.5	14d	1.5	1.5	1.5	1.5	1.5	1.5	14d	2	1.5	0
1:1 ratio 50SG	0.4 - 0.8 oz SG	C18	1.5	0	2	1.5	14d	1.5	1.5	1.5	1.5	1.5	1.5	14d	2	1.5	0
1:1 ratio 75DF*	0.25 - 0.5 oz DF	C18	1.5	0	2	1.5	14d	1.5	1.5	1.5	1.5	1.5	1.5	14d	2	1.5	0
tribenuron																	
Express 50SG	0.25 - 0.5 oz SG	C18	1.5	0	2	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2	1.5	0
Generics 75DF*	0.17- 0.33 oz DF	C18	1.5	0	2	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2	1.5	0
Valor + tillage	2 oz	B2	4	3	4	4	1	3	3	4b	4	4b	4	0	4	1	1
- tillage	2 oz	B2	8	3	8	8	14d	3	3	8b	8	8b	8	0	8	1	1
+ tillage	3 oz	B2	5	4	12	12b	1	4	4	12b	5	12b	12b	0	5	2	2
- tillage	3 oz	B2	10	4	12	12b	1	4	4	12b	10	12b	12b	0	10	2	2

*= Refer to pages 82-83 for generic brands names and commercial mixtures.
b = bioassay
d = days before planting
NCS = Next cropping season
Spartan Charge = Registration Pending
thifensulfuron & tribenuron 4:1 50SG = Affinity TankMix
thifensulfuron & tribenuron 1:1 50SG = Affinity BroadSpec
Valor = refer to label for rates >3 oz/A.

Glyphosate product rates based on formulation, acid equivalent (ae) and active ingredient (ai).

lb ae		lb ai	0.75 ae	1.125 ae	1.5 ae	2.25 ae	3 ae
			---------- fl oz/A ----------				
3	=	4 =	32	48	64	96	128
4	=	5.4 =	24	36	48	72	96
4.17	=	5.1 =	24	36	48	72	96
4.5	=	5.5 =	22	32	44	64	88
5	=	6.1 =	20	30	40	60	80

Lbs ae/gal or ai/gal are found on glyphosate product labels. Refer to page 4 for an explanation of active ingredient (ai) and acid equivalent (ae).

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
Refer to page 12 for Fall or Spring Early Preplant Herbicides.				
Soil-Applied Herbicides				
Far-Go (triallate) 	**HRSW & DURUM.** **1 qt / 10 lb 10G** (1) **BARLEY**: **1.25 qt/12.5 lb 10G** (1.25 lb)	Wild oat.	Spring: HRSW, Durum and Barley. Apply before or after seeding. PPI 3 or more days before seeding.	Application before seeding: PPI with field cultivator set at 4 inches deep. Two pass incorporation is recommended. Application after seeding: Apply before kernel sprouts exceed 0.5 inch in length and incorporate with harrows set more shallow than seed. A1 B1 C11 S6
Buckle (triallate & trifluralin) 	**DURUM & BARLEY.** **10 to 12.5 lb G** (1 to 1.25 & 0.3 to 0.4 lb)	Wild oat and foxtails.	Fall: Apply within 3 weeks of freeze up. Spring: Barley only. Prior to seeding.	**Do not apply to HRSW.** Incorporate within 24 hours after application. Set 2nd incorporation more shallow than first. Stand reduction may occur. Do not apply on soil treated with trifluralin the previous year. A1 B1 C11 C19 S2 S6 Y14 X1
	HRWW. **Fall: 12.5 to 15 lbG** **HRSW.** **Spring: 10 lb G** (1 & 0.3 lb)		HRWW: Fall. HRSW: Spring PPI only.	Use only in designated counties in North Dakota. Apply only to fields fallowed the previous year. Do not apply to soil treated with trifluralin the previous year. A1 B1 C11 C19 S6
trifluralin **Not for Winter Wheat**	**1 pt 4E** **5 lb 10G** (0.5 lb)	Foxtail.	Spring: PPI.	**FOR BARLEY ONLY.** Incorporate twice 2 to 3 inches deep. A1 B1 Pages: 78-80, 82-83.
	4 lb 10G (0.4)			**FOR DURUM WHEAT ONLY.** For foxtail suppression only. A1 B1 C19 S2 Y14 X1. Pages: 78-80, 82-83.
	3.5 to 4 lb 10G (0.35 to 0.4 lb)			**FOR HRSW ONLY.** For suppression of foxtail only. Use west of Hwy 3 only. B1 S2. Pages: 78-80, 82-83.
	1 pt 4E (0.5 lb)		Spring: After seeding.	Plant 2 to 2.5 inches deep. Incorporate shallow twice with flex-tyne or diamond harrow 1 to 1.5 inches deep. A1 B1 C19 S2 Y14 X1. Pages: 78-80, 82-83.
	1 pt 4E **5 lb 10G** (0.5 lb)		Fall: After September 1 until freeze-up.	Incorporate once in fall within 24 hours after application. Keep spring incorporation depth more shallow than fall. Stand reduction may occur. A1 B1 C19 S2 X1 Y14. Pages: 78-80, 82-83.
	3.5 to 5 lb 10G (0.35 to 0.5 lb)			**FOR HRSW AND DURUM ONLY.** For foxtail suppression only. B1 S2. Pages: 78-80, 82-83.

Pages 78-80 = Crop rotation restrictions, Pages 82-83 = Generic and commercial names, Pages 120-121 = Herbicides resistant weeds.

Hard Red Spring and Durum Wheat, Winter Wheat and Barley

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
POST-Applied Herbicides				
Prowl H20 (pendimethalin) **Not for Barley**	**1.5 to 3 pt** (0.7 to 1.4 lb)	Foxtail and some small-seeded broadleaf weeds.	Wheat: 1- to 3-leaf.	Soil residue provides PRE control of weeds. Does not control emerged weeds. Adjust rate for soil type. Allow a 60 day PHI. Refer to label for tank-mixtures. B1 C19 E10. Pages: 78-80, 82-83.
MCPA amine MCPA ester	**0.5 to 1.33 pt 4SL** **0.5 to 1.33 pt 4EC** (0.25 to 0.66 lb ae)	Broadleaf weeds.	Crop: Emergence until prior to boot. Winter wheat: In spring from 4-leaf until prior to boot.	Apply 0.5 to 1 pt/A from emergence to tiller stage. Use high rate for large or perennial weeds. A3 A6 C1-2 S3-5. Pages: 82-83, 120-121
2,4-D amine 2,4-D ester	**0.5 to 1 pt 4SL** **0.5 to 1 pt 4EC** (0.25 to 0.5 lb ae)		Crop: 3-leaf until prior to boot. Winter wheat: Well tillered until prior to boot.	Follow label directions as 2,4-D labels vary on application timing. Do not apply from early boot to dough stage. Do not apply to winter wheat in fall. A3 A6 B3 C1-2 S3-5. Pages: 82-83, 120-121.
dicamba	**2 to 4 fl oz** (1 to 2 oz) **Barley: 2 to 3 fl oz** (1 to 1.5 oz ae)	Broadleaf weeds including wild buckwheat, sunflower, Russian thistle and kochia.	HRSW/Durum: Up to 5-lf Barley: Up to 4-leaf. HRWW: Pre-joint.	Apply at proper crop stage to avoid injury. Dicamba must be applied before 6-leaf stage. Use low dicamba rate and high MCPA rate on 4-leaf HRSW or durum. Barley is relatively susceptible to injury from dicamba. Do not apply dicamba with 2,4-D to barley. A3 A6 B5 C1-2 C8 S1 S3-5 X1 Y10. Pages: 82-83, 120-121.
clopyralid & MCPA	**1.75 to 2.33 pt** (0.09 to 0.12 & 0.5 to 0.68 lb ae)	Broadleaf weeds and Canada thistle.	Crop: 3-leaf until prior to boot.	Apply to Canada thistle at rosette to early bolting stage. Do not harvest hay from treated fields. A3 C7 S1 T2 T6. Pages: 78-80, 82-83, 120-121.
clopyralid & 2,4-D	**2 to 2.67 pt** (0.09 to 0.13 & 0.5 to 0.67 lb ae)		Crop: 4-leaf until prior to boot.	
fluroxypyr	**0.5 - 0.67 pt 1.5EC** **0.25 - 0.35pt 2.8EC** **3.75 - 5 oz 40WDG** (1.5 to 2 oz ae)	Kochia, volunteer flax, and few other broadleaf weeds.	Crop: 2-leaf through flag leaf emergence. Weeds: 4 to 8 inches tall.	Refer to label for weeds controlled, registered tank-mix options, and rates. A3 C7 S3. Pages: 82-83, 120-121.
clopyralid & fluroxypyr	**1 to 1.33 pt** (0.09 to 0.125 & 0.09 to 0.125 lb ae)	Broadleaf weeds including kochia, wild buckwheat, vol. flax, and Canada thistle.	Crop: 3-leaf through flag leaf emergence. Weeds: Up to 4 inches tall or vining.	An economical formulation of clopyralid. Apply with 2,4-D, MCPA, or Harmony GT to increase spectrum of broadleaf weed control. Does not antagonize POST grass herbicides labeled in small grains. Refer to label for application information. A3 C7 S1 S3 T2 T6. Pages: 78-80, 82-83, 120-121.

Pages 78-80 = Crop rotation restrictions, Pages 82-83 = Generic and commercial names, Pages 120-121 = Herbicides resistant weeds.

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
bromoxynil	**1 to 2 pt** (0.25 to 0.5 lb)	Small broadleaf weeds including small kochia.	Crop: Emergence until prior to boot stage.	Contact, non-residual herbicide requiring thorough coverage. Most active in hot and sunny conditions. Refer to label for tank-mix options.
bromoxynil & MCPA	**1 to 2 pt 4EC** **0.8 to 1.6 pt 5EC** (0.25 to 0.5 & 0.25 to 0.5 lb ae)	Small broadleaf weeds including wild buckwheat, sunflower, Russian thistle and kochia.	Crop: 3-leaf stage until prior to boot stage.	A3 CB1-2 S1 S3 S4 X1. Pages: 82-83.
bromoxynil & 2,4-D	**0.75 to 1.5 pt** (0.18 to 0.38 & 0.25 to 0.5 lb ae) Rates vary by label.			A3 C1-2 S1 S3 X1. Pages: 82-83.
Starane NXT (bromoxynil & fluroxypyr)	**14 to 21 fl oz** (4 to 6 oz & 1 to 1.5 oz)		Crop: 3-leaf stage to flag leaf emergence.	Higher rates or a tank-mix partner may be required for high weed populations and weeds greater than 4 inches tall. A3 C1-2 C7 S1 S3 X1
Aim (carfentrazone)	**0.5 fl oz EC** (0.128 oz)	Small broadleaf weeds including pigweed and kochia.	Crop: Up to jointing stage. Weeds: Small. Up to 2 inches tall.	Contact, non-residual herbicide requiring thorough coverage. May cause cosmetic speckling on wheat leaves. Add NIS at 0.25% v/v. Refer to label for tank-mix options and application information. A3 B4 C4 S1 S3 S5 X1
Rage D-Tech (carfentrazone & 2,4-D)	**8 to 12 fl oz** (0.128 to 0.192 oz & 4 to 6 oz ae)	Broadleaf weeds.	Crop: 3-tillers to jointing stage. Weeds: Small.	Add NIS at 0.25% v/v. May cause cosmetic speckling on wheat leaves. Do not apply with bromoxynil. Refer to label for application information. A3 B4 C2 C4 S1 S3 S5 X1
Huskie (bromoxynil & pyrasulfotole & mefenpyr safener)	**11 to 15 fl oz EC** (0.156 to 0.207 & 0.027 to 0.036 lb)	Most annual broadleaf weeds including resistant weeds.	Crop: Up to flag leaf emergence. Weeds: Up to 4 inches tall.	Most crops can be planted the year following application. Refer to label for tank-mix options and application information. C12 S1 S3-5 S7 X1
Wolverine (fenoxaprop & bromoxynil & pyrasulfotole & mefenpyr safener) **Registration Pending**	**1.7 pt EC** (0.08 & 0.156 & 0.027 lb)	Annual grass and broadleaf weeds.		A3 C12 C17. Pages: 120-121.

Pages 78-80 = Crop rotation restrictions, Pages 82-83 = Generic and commercial names, Pages 120-121 = Herbicides resistant weeds.

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
Short Residual ALS Herbicides				
Orion (florasulam & MCPA ester)	**17 fl oz** (0.07 oz & 0.31 lb)	Some broadleaf weeds.	Crop: 3-leaf until boot. Weeds: Small.	Add NIS at 0.25% v.v. May be tank-mixed with grass herbicides. Allow a 60 day PHI. Refer to label for application information. A3 X1
thifensulfuron DF **Harmony SG**	**0.3 to 0.6 oz DF** **0.45 to 0.9 oz SG** (0.225 to 0.45 oz)	Mustards, redroot pigweed, lambsquarters, wild buckwheat, smartweed, and sunflower.	Crop: 2-leaf until prior to flag leaf emergence.	Do not apply higher tribenuron rates with POST grass herbicides. Addition of MCPA ester or 2,4-D ester improves broadleaf weed control and crop safety. Add NIS at 0.125% v/v except when adding 2,4-D or MCPA at 0.75 pt/A. Apply with a broadleaf herbicide with a different mode of action to delay weed resistance. No crop rotation restrictions the following year. Refer to label for list of registered tank-mixes. A3 A5 C18 S1 S3 S5 X1 Y1 Y3. Pages: 82-83, 120-121.
tribenuron DF **Express SG**	**0.17 to 0.33 oz DF** **0.25 to 0.5 oz SG** (0.125 to 0.25 oz)	Mustards, marshelder, prickly lettuce, Russian thistle, Canada thistle.		
thifen & tribenuron 4:1 ratio 75DF **Affinity T/M 50SG** 2:1 ratio 75DF 1:1 ratio 75DF **Affinity B/S 50SG**	**0.4 to 0.67 oz DF** **0.6 to 1 oz SG** **0.3 to 0.66 oz DF** **0.25 to 0.5 oz DF** **0.4 to 0.8 oz SG**	Provides a broader spectrum of control than either a.i. alone. Choose ratio based on prevalent weeds.		
Long Residual ALS Herbicides				
metsulfuron	**0.1 oz XP** (0.06 oz)	Broadleaf weeds including perennial sowthistle. Partial control of wild buckwheat.	Crop: 2-leaf until prior to boot.	Addition of 2,4-D ester or MCPA ester improves broadleaf weed control and crop safety. Add NIS at 0.125% except when adding 2,4-D or MCPA at 0.75 pt/A. Refer to label for crop rotation restrictions. Apply with a broadleaf herbicide with a different mode of action to delay weed resistance. Do not apply within 22 months of last metsulfuron treatment. Do not apply to soils above pH 7.9. A3 A5 C14 S1 X1 Y13 Y36 Y6. Pages: 78-80, 82-83, 120-121.
metsulfuron & thifensulfuron & tribenuron	**0.2 to 0.4 oz DF** (0.116 to 0.231 oz)	Broadleaf weeds including perennial sowthistle. Improved control of wild buckwheat.	Crop: 2-leaf until prior to flag leaf emergence.	
Agility (dicamba & metsulfuron & thifensulfuron & tribenuron)	**1.6 to 3.2 oz SG** (1.16 to 2.32 oz)	Most annual and perennial (top-growth only) broadleaf weeds.	Crop: 2- to 6-leaf.	
Peak (prosulfuron)	**0.38 to 0.5 oz DF** (0.22 to 0.29 oz)	Broadleaf weeds.	Crop: 3-leaf until 2nd node is detectable.	Refer to label for application information. A38 C16 X1 Y1 Y3. Pages: 78-80, 120-121.
Very Long Residual ALS Herbicides				
Amber (triasulfuron)	**0.28 to 0.56 oz DF** (0.21 to 0.42 oz)	Broadleaf weeds.	Crop: 2-leaf until prior to boot stage.	Add NIS at 0.125 to 0.25%v/v. Refer to label for application timings, tank-mix options, weeds controlled, and soil pH restrictions. A3 A5 C5 X1 Y1 Y3 Y6. Pages: 78-80, 120-121.
Rave (triasulfuron & dicamba)	**HRSW = 4 oz DF** (0.352 to 2 oz**)** **Barley = 2 oz DF** (0.176 to 1 oz)		HRSW : Up to 5-leaf stage. Barley: Up to 4-leaf stage.	
chlorsulfuron	**1.67 to 0.33 oz DF** (0.125 to 0.25 oz)	Broadleaf weeds and suppression of foxtail and Canada thistle.	Crop: 2-leaf until prior to flag leaf emergence.	Add NIS at 0.125% except when adding 2,4-D ester or MCPA ester at 0.75 pt/A. Refer to label for application timings, tank-mix options, weeds controlled, and soil pH restrictions. A3 A5 C5 X1 Y1 Y3 Y6. Pages: 78-80, 82-83, 120-121.
chlorsulfuron & metsulfuron)	**0.2 to 0.4 oz DF** (0.15 to 0.3 oz)			

Pages 78-80 = Crop rotation restrictions, Pages 82-83 = Generic and commercial names, Pages 120-121 = Herbicides resistant weeds.

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
POST-Applied Grass Herbicides				
Axial XL (pinoxaden & cloquintocet safener) **Not for Durum**	**16.4 fl oz** (0.05 lb)	Foxtail, wild and volunteer oat, Persian darnel, and annual ryegrass.	Crop: 2-leaf to boot. Grasses: 1-leaf to 6-leaf + 3 tillers.	Axial XL is formulated with Adigor adjuvant. May be tank-mixed with most broadleaf herbicides. Refer to label for application and tank-mix information, and restrictions. A3 S2 S6 X1. Pages: 120-121.
Achieve Liquid (tralkoxydim)	**6.9 fl oz** (0.18 lb)	Green and yellow foxtail, wild and volunteer oat, Persian darnel, and annual ryegrass.	Crop: 2-leaf to boot. Foxtail: 1- to 5-leaf. Wild oat: 1- to 6-leaf.	Do not apply Achieve on spring wheat east of ND Hwy 281 or in the following ND counties: Dickey, LaMoure, Stutsman, Foster, Eddy, Ramsey, and Towner. Add AMS at 7 to 15 lb/100 gal water. Add Supercharge at 0.5% v/v. Refer to label or narrative for tank-mix information and restrictions. A3 A6 C3 S2 S6 X1. Pages: 120-121.
Discover NG (clodinafop & cloquintocet safener) **Not For Barley**	**12.8 to 16 fl oz** (0.05 to 0.06 lb)	Oat, green and yellow foxtail, barnyardgrass, Persian darnel, and annual ryegrass.	Wheat: 2-leaf until prior to boot. Wild oat: 1- to 6-leaf. Foxtails: 1- to 5-leaf.	Discover NG is formulated with oil adjuvant. Add MSO adjuvant at 0.25% v/v if <10 gpa. Apply higher rates for Persian darnel and ryegrass. Refer to label for rates and tank-mix information. A3 C9 S2 S6 X1. Pages: 120-121.
Puma (fenoxaprop-P & mefenpyr safener)	**0.33 to 0.66 pt** (0.04 to 0.08 lb)	Wild oat, green and yellow foxtail, millets, corn, and barnyardgrass.	Wheat: Emergence to 60 days PHI. Barley: 1-leaf to 4-leaf stage. Grass weeds: 1-leaf to 2-tiller.	Do not apply to barley after the 4-leaf stage of growth. For Puma: Apply 0.33 pt/A for green foxtail, vol. corn and millet. Apply 0.4 pt/A for yellow foxtail and proso millet. Apply 0.66 pt/A for barnyardgrass and wild oat. Refer to label for tank-mix options. A3 A6 C12 C17 S2 S6 X1. Pages: 120-121.
Wolverine (fenoxaprop & bromoxynil & pyrasulfotole & mefenpyr safener) **Registration Pending**	**1.7 pt EC** (0.08 & 0.156 & 0.027 lb)	Annual grass and broadleaf weeds.		
Avenge (difenzoquat)	**2.5 to 4 pt** (0.62 to 1 lb)	Wild oat.	Crop: Prior to flag leaf emergence. Wild oat: 3- to 5-leaf stage.	Labeled on all barley varieties. Use the high rate on 3-leaf wild oat. Injury may occur when crop is under stress. Refer to label for tank-mix options and registered wheat varieties. A3. Pages: 120-121.
Assert (imazamethabenz) **Long Residual**	**1 to 1.5 pt** (0.31 to 0.47 lb)	Wild oat, wild mustard, and other mustard species.	Crop: 2-leaf to jointing. Wild oat: 1- to 4-leaf stage.	Do not tank-mix with dicamba, or amine phenoxys. Add MSO-type adjuvants or NIS + petroleum oil adjuvant. Refer to label for tank-mix options and adjuvant information. A3 C6 S6 Y2 Y6. Pages: 78-80, 120-121.
Everest (flucarbazone) **Not For Barley** **Short to Long Residual**	**0.3 to 0.6 oz WDG** (0.21 to 0.42 oz) Do not exceed a total of 0.6 oz Everest + Prepare.	Wild oat, green foxtail, mustards, and pigweed. Partial control of yellow foxtail, barnyardgrass, downy brome, Japanese brome and Persian darnel	Wheat: 1-leaf to prior to jointing. Grass weeds: Up to 4 leaves.	Add NIS up to 0.25% v/v or basic pH blend adjuvant at 1% v/v except when adding an emulsifiable concentrate (EC) or ester formulated broadleaf herbicides. Apply 0.3 oz/A for green foxtail, 0.4 to 0.6 oz/A for wild oat, and 0.6 oz/A for high grass densities and for weeds that are partially controlled. 2,4-D or dicamba is required for safening when tank-mixing with SU herbicides. A3 C10 S2 S6 X1. Pages: 78-80, 120-121.
Maverick (sulfosulfuron) **Not For Barley** **Very Long Residual**	**0.67 oz DF** (0.5 oz)	Downy brome, Japanese brome, quackgrass, mustard species and volunteer sunflower.	Wheat: Emergence to prior to jointing. Bromes: 2- to 3- tillers. Wild oat: 1- to 4-leaf stage.	Add NIS at 0.5%v/v. Refer to label for tank-mix options. Fall applications provide greater brome and cheatgrass control than spring applications. Spring applications may control wild oat. A3 A5 C13 X1 Y3 Y6. Pages: 78-80, 120-121.

Pages 78-80 = Crop rotation restrictions, Pages 82-83 = Generic and commercial names, Pages 120-121 = Herbicides resistant weeds.

Hard Red Spring and Durum Wheat, Winter Wheat and Barley

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
Olympus (propoxy-carbazone) **Not For Barley** **Very Long Residual**	**0.6 to 0.9 oz/A WG** (0.42 to 0.63 oz)	Quackgrass, downy brome, Japanese brome, foxtail barley and mustard species.	Wheat: 2-leaf to jointing. Grasses: 2-leaf to 2-tiller. Broadleaf weeds: Less than 2 inches tall or in diameter.	**Application to spring wheat may cause injury.** Do not apply after jointing begins. Allow a 71 day PHI. Add NIS at 0.25 to 0.5% v/v. May be applied with liquid fertilizer. Use high rate for wild oat and brome species. Refer to label for tank-mix options. A3 S2 S6 X1 Y2 Y4. Pages: 78-80, 120-121.
Rimfire (mesosulfuron & propoxycarbazone & mefenpyr safener) **Not For Barley** **Short to Long Residual**	**1.75 to 2.25 oz WG** (0.035 to 0.045 & 0.143 to 0.184 oz)	Wild oat, barnyardgrass, seedling foxtail barley, bromus grass species, and mustard species.	Wheat: 1-leaf to flag leaf emergence. Grasses: 1-leaf to 2-tiller. Broadleaf weeds: Less than 2 inches tall.	Add MSO adjuvant at 1.25 pt/A, or NIS at 0.5% v/v + 28% UAN at 1 to 2 qt/A, or basic pH blend adjuvant at 1% v.v (0.8 to 1.6 pt/A). Do not use petroleum oil or adjuvants containing organosilicone because wild oat control will be reduced. Refer to label for tank-mix options. A3 C15 S2 S6 X1 Y2 Y6. Pages: 78-80, 120-121.
Silverado (mesosulfuron & mefenpyr safener) **Not for Barley** **Short Residual**	**1.75 to 2.25 oz WG** (0.035 to 0.045 oz)	Wild oat, mustard species, and volunteer canola.	Wheat: 1-leaf to prior to jointing. Wild oat: 1-leaf to 2-tiller. Broadleaf weeds: Less than 2 inches tall.	Do not apply after jointing begins. Add a Bayer-approved adjuvant. Will control ACC-ase resistant wild oat. Allow a 55 day PHI. Refer to label for tank-mix information. A3 S6 X1. Pages: 120-121.
PowerFlex (pyroxsulam) **Only for Winter Wheat** **Short Residual**	**3.5 oz WDG** (0.26 oz)	Wild oat, downy brome and suppression of green foxtail.	Wheat: 3-leaf to prior to jointing. Grass weeds: 2- to 4-leaf. Broadleaf weeds: Less than 3 inches tall.	Do not apply after jointing begins. Will control ACC-ase resistant wild oat. Allow a 60 day PHI. For PowerFlex: Add NIS at 0.25 to 0.5% v/v + AMS at 1.5 lb/A or PO at 0.8% v/v. May be applied with 50% N spray solution.
GoldSky (pyroxsulam + florasulam + fluroxypyr) **Not for Barley** **Short Residual**	**1 pt** (0.21 & 0.04 & 1.42 oz)	Wild oat, downy brome, green foxtail, kochia, wild mustard, and wild buckwheat.		For GoldSky: Add NIS at 0.25 to 0.5% v/v + AMS at 1.5 lb/A. Do not add NIS with tank-mix of EC herbicides. Refer to label for tank-mix information and restrictions. A3 C7 X1

Pages 78-80 = Crop rotation restrictions, Pages 82-83 = Generic and commercial names, Pages 120-121 = Herbicides resistant weeds.

HERBICIDE RESISTANT WHEAT

Clearfield Wheat

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
Beyond (imazamox) **Long Residual**	**4 fl oz** (0.5 oz)	Annual grass and broadleaf weeds including wild oat, green and yellow foxtail, Japanese and downy brome, and Persian darnel.	Wheat: 4-leaf to prior to jointing. Weeds: 1 to 3 inches tall.	**Apply only to Clearfield wheat varieties.** Add NIS at 0.25% v/v + UAN at 1 to 2 qt/A. Refer to label for tank-mix options and application information. Will suppress feral rye. Will not control ALS-resistant kochia and wild oat. A3 A5-7 C20 X1 Y2. Pages: 78-80, 120-121.
ClearMax (imazamox & MCPA)	**4 + 8 fl oz** (0.5 & 4 oz) Winter wheat: Up tp 18 fl oz.			

Pages 78-80 = Crop rotation restrictions, Pages 82-83 = Generic and commercial names, Pages 120-121 = Herbicides resistant weeds.

Grass weed control from postemergence applications.

POST GRASS HERBICIDES	Wild oat	Foxtail, Green	Foxtail, Yellow	Barnyardgrass	Corn, Volunteer	Downy brome*	Japanese brome*	Persian darnel	Ryegrass, Annual	Quackgrass	Foxtail barley
Achieve	E	G-E	G	F	-	N	N	G	G	N	N
Assert	F-G	P	P	P	-	-	-	-	-	N	N
Axial XL	E	E	G-E	G-E	N	N	N	E	E	N	N
Beyond/ClearMax	E	E	G-E	E	G-E	G-E	E	E	G-E	F	-
Discover NG	E	E	G-E	E	E	N	N	G-E	G-E	-	N
Everest	G-E	E	P-G	F-G	E	P-F	G	F-G	P-F	P-F	F
GoldSky	G-E	F	F-G	F-G	-	F-G	G-E	-	G-E	F	F
Maverick**	E	P-F	P-F	P	-	F-G	G	-	P-F	G	-
Olympus	G-E	P-F	P-F	G	-	F-G	E	N	-	F-G	G
PowerFlex	G-E	F	F-G	F-G	-	F-G	G-E	-	G-E	F	F
Puma	E	E	E	E	E	N	N	-	-	N	N
Rimfire	G-E	P-F	P-F	G	F-G	P-F	G	F-G	-	F	F-G
Rimfire Top-Up	G-E	P-F	P-F	G	F-G	P-F	G	G-E	-	F	F-G
Silverado	G	P	P	N	F-G	P	P-F	F-G	-	N	P-F

*Early fall applications provide better control that late fall or spring.
Earlier spring application are more effective than late spring or mid-season application.

**Suggested for use only in continuous wheat because of crop rotation restrictions.

Weed control ratings are based on the following scale:

E = Excellent = 90 to 99% control
G = Good = 80 to 90% control
F = Fair = 65 to 80% control
P = Poor = 40 to 65% control
N = None = No control

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs

Refer to page 12 for Fall or Spring Early Preplant Herbicides.

Callisto (mesotrione)	**3 to 6 fl oz** (1.5 to 3 oz)	Many broadleaf weeds including those resistant to other herbicides.	PRE.	Callisto PRE requires rain for activation. For POST application add petroleum oil at 1% v/v or NIS at 0.25% v/v + UAN at 2.5% v/v or AMS at 8.5 lb/100 gal water. Addition of bromoxynil will increase risk of oat injury. Allow a 50 day PHI. A3 A7 D7 X1 Y9. Pages: 78-80.
	3 fl oz (1.5 oz)		POST. Weeds: Up to 5 inches tall.	
MCPA amine MCPA ester	**0.5 to 1 pt 4SL** **0.5 to 1 pt 4EC** (0.25 to 0.5 lb ae)	Broadleaf weeds.	Oat: Emergence until prior to boot stage.	Possible oat injury at any stage. A3 A6 C1-2 S3 X1. Pages: 82-83, 120-121.
bromoxynil	**1 to 1.5 pt EC** (0.25 to 0.38 lb)	Small broadleaf weeds including wild buckwheat, and volunteer sunflower.		Bromoxynil is a non-residual, contact herbicide requiring thorough coverage. Most active in hot and sunny conditions. Controls ALS-resistant kochia. Refer to label for tank-mix options. A3 C1-2 S3 S4 X1. Pages: 82-83, 120-121.
bromoxynil & MCPA	**1 to 2 pt 4EC** **0.8 to 1.6 pt 5EC** (0.25 to 0.5 & 0.25 to 0.5 lb ae)		Oat: 3-leaf until prior to boot stage.	
dicamba + MCPA	**2 to 4 fl oz +** **0.5 to 0.75 pt 4L** (0.06 to 0.12 + 0.25 to 0.38 lb ae)	Broadleaf weeds.	Oat: 2- through 5-leaf stage.	Use the low dicamba rate and high MCPA rate on 5-leaf oat. Early application increases crop safety. A3 A5-7 C2 C8 S1 S3 X1 Y10. Pages: 82-83, 120-121.
clopyralid & MCPA ester	**1.75 to 2.33 pt** (0.09 to 0.12 & 0.5 to 0.68 lb ae)	Broadleaf weeds and Canada thistle.	Oat: 3-leaf to jointing or to boot if risk of injury is acceptable.	Apply to Canada thistle at the rosette to early bolting stage. A3 C7 T2 T6. Pages: 78-80, 82-83, 120-121.
fluroxypyr	**0.5 - 0.67 pt 1.5EC** **0.25 - 0.35pt 2.8EC** **3.75 - 5 oz 40WDG** (1.5 to 2 oz ae)	Kochia including ALS-resistant and volunteer flax.	Oat: 2-leaf through flag leaf emergence. Weeds: Small.	Non-residual herbicide. Allow a 40 day PHI. Refer to label for tank-mix options. A3 C7 S3. Pages: 82-83, 120-121.
clopyralid & fluroxypyr	**1 to 1.33 pt** (0.09 to 0.125 & 0.09 to 0.125 lb ae)	Broadleaf weeds including kochia, wild buckwheat, vol. flax, and Canada thistle.	Oat: 3-leaf through flag leaf emergence. Weeds: Up to 4 inches tall or vining.	An economical formulation of clopyralid. Addition of 2,4-D, MCPA, or thifensulfuron increases broadleaf weed control. Compatible with all POST grass herbicides labeled in small grains. Refer to label for application information. A3 C7 S1 S3 T2 T6. Pages: 78-80, 82-83, 120-121.
thifensulfuron **Harmony SG**	**0.3 to 0.4 oz DF** **0.45 to 0.6 oz SG** (0.225 to 0.3 oz)	Some broadleaf weeds.	Oat: 3- through 5-leaf stage but before jointing.	Do not use on Ogle, Porter, or Premier oat varieties. Addition of MCPA ester at 0.75 pt/A enhances broadleaf weed control and oat safety. Add NIS at 0.125% v/v except when adding MCPA at 0.75 pt/A. Refer to label for list of tank-mix options. A3 A5-7 C18 S1 S3 X1. Pages: 82-83, 120-121.
thifen & tribenuron 4:1 ratio 75DF **Affinity T/M 50SG** 2:1 ratio 75DF 1:1 ratio 75DF **Affinity B/S 50SG**	 **0.4 to 0.67 oz DF** **0.6 to 1 oz SG** **0.3 to 0.66 oz DF** **0.25 to 0.5 oz DF** **0.4 to 0.8 oz SG**	Provides a broader spectrum of control than either a.i. alone. Choose ratio based on prevalent weeds.		
Peak (prosulfuron)	**0.38 to 0.5 oz DF** (0.22 to 0.29 oz)	Broadleaf weeds.	Oat: 3-leaf until 2nd node is detectable.	Add NIS at 0.25% v/v. Refer to label for list of tank-mix options and weeds controlled. A3 A6 C16 X1 Y3. Pages: 78-80, 120-121.

Pages 78-80 = Crop rotation restrictions, Pages 82-83 = Generic and commercial names, Pages 120-121 = Herbicides resistant weeds.

SMALL GRAIN PRE/POST-HARVEST

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
glyphosate **For HRS, Durum and Winter Wheat and Feed Barley Only.**	Up to 0.75 lb ae **See Remarks.**	Annual and perennial grass and broadleaf weeds including Canada thistle.	Wheat and barley: Hard-dough stage, 30% or less grain moisture. Allow a 7 day PHI.	lb ae/gal lb ai/gal 0.38 ae 0.57 ae 0.75 ae 3 4 = 16 fl oz 24 fl oz 32 fl oz 4/4.17 5.4/5.1 = 12 fl oz 18 fl oz 24 fl oz 4.5 5.5 = 11 fl oz 16 fl oz 22 fl oz 5 6.1 = 10 fl oz 15 fl oz 20 fl oz Do not apply more than 0.75 lb ae/season. **Do not apply on wheat or barley grown for seed because reduced germination/vigor may occur.** Apply 0.75 lb ae/A or more for Canada thistle control. May be applied with 2,4-D or dicamba for improved broadleaf weed control. Add AMS fertilizer at 4 lb/100 gal, or more for hard water. Refer to label for adjuvant use and application information. A3-7 B2 C21-25 T2 T6-7 X1
2,4-D ester **For HRS, Durum, and Winter Wheat, Barley, and Rye**	**1.5 to 3 pt 4EC/SL** (0.75 to 1.5 lb ae)	Broadleaf weeds.	Wheat: Dough stage to harvest.	Use only when the weeds will interfere with harvest operations. Do not feed straw to livestock. Use only 2,4-D brands labeled for preharvest application. CAUTION: Drift to broadleaf crops is especially hazardous at this time. C21-25 T4-6 X1
dicamba + 2,4-D **For HRS, Durum, and Winter Wheat Only**	**0.5 to 1 pt +** **1 to 2 pt 4EC/SL** (0.25 to 0.5 + 0.5 to 1 lb ae)		Wheat: Hard-dough stage and green color is gone from the nodes (joints) of the stem.	Allow a 7 day PHI. Do not feed treated straw to livestock. CAUTION: Drift to broadleaf crops is especially hazardous at this time. A3 A6 C2 C21-25 T5-6 X1 Y10
thifen & tribenuron 4:1 ratio 75DF **Affinity T/M 50SG** 2:1 ratio 75DF 1:1 ratio 75DF **Affinity B/S 50SG**	 **0.6 to 1 oz DF** **0.4 to 0.66 oz SG** **0.3 to 0.66 oz DF** **0.25 to 0.5 oz DF** **0.4 to 0.8 oz SG**	Provides a broader spectrum of control than either a.i. alone. Choose ratio based on prevalent weeds.	Wheat and barley: Dough stage. Allow a 10 day PHI.	May be applied with glyphosate, 2,4-D, Aim, or fluroxypyr. Add NIS at 0.25% v/v. Refer to label for for grazing restrictions. Use only registered brands for preharvest application. A3 A5-6 C18
metsulfuron + 2,4-D **For HRS, Durum, and Winter Wheat and Barley Only**	**0.1 oz XP +** **1.5 to 3 pt 4EC/SL** (0.06 oz + 0.75 to 1.5 lb ae)			For use in wheat/fallow or continuous wheat. Do not use if crop was treated previously with an ALS herbicide. Add NIS at 0.25% v/v. May be tank-mixed with dicamba in wheat for resistant weed management. Metsulfuron has no grazing restrictions. Refer to 2,4-D label for grazing restrictions and for brands labeled for preharvest application. A3 A5-6 C23 Y3. Pages: 78-80, 120-121.
Aim (carfentrazone)	**0.5 to 1 fl oz EC** (0.128 to 0.256 oz)	Small broadleaf weeds.	Wheat: Dough stage to harvest.	Non-residual, contact herbicide requiring thorough coverage. Most active in hot and sunny conditions. Add NIS at 0.25% v/v. Allow a 3 day PHI. B4 C4 S1 S3-4 X1
Rage D-Tech (carfentrazone & 2,4-D)	**16 to 32 fl oz** (0.256 to 0.512 oz & 0.5 to 1 lb ae)	Broadleaf weeds.		Add MSO at 1 to 2% v/v or petroleum oil at 1.5 to 2% v/v. May add UAN at 2 to 4% v/v or AMS at 2 to 4 lb/A. Allow a 3 day PHI. B4 C4 S1 S3-4 X1

Pages 78-80 = Crop rotation restrictions, Pages 82-83 = Generic and commercial names, Pages 120-121 = Herbicides resistant weeds.

HERBICIDES REGISTERED ON SMALL ACREAGE CROPS IN NORTH DAKOTA

The following chart is only an aid to identify registered herbicides on the following crops. Not all labels of similar active ingredients cover identical crops. Not all formulations are registered in the state of North Dakota. Refer to the ND Dept of Ag web site for formulations registered in the state. Many products require specific application instructions and not all formulations can be used in-crop with adequate crop tolerance. For example, glyphosate is registered on most crops listed as a PRE or directed application between rows but glyphosate applied POST on crop foliage will kill crop plants. Refer to pages 124 to 130 for additional information on products listed.
User must follow label directions. Refer to label of specific product:
1. To determine what crops are registered.
2. For application instructions.
3. For all other restrictions and use information.

Herbicides registered on small acreage crops.

BUCKWHEAT

Aim (carfentrazone) - Preplant
ET (pyraflufen)
glyphosate - Preplant
Poast (sethoxydim)

JUNEBERRY

glyphosate - Preplant
Poast (sethoxydim)
Chateau (flumioxazin)

LAWN (Grass weed control)

Acclaim Extra (fenoxaprop)**, Certainty** (sulfosulfuron), **Dimension/Ultra** (dithiopyr), **Drive** (quinclorac), **Pendulum** (pendimethalin), **Weed B Gon Max + Crabgrass Control**.

LAWN (Broadleaf weed control)

	MCP	2,4-D	dic	tric	other
All in One Weed Killer	MCPP	x	x	-	MSMA
Brush Killer	DCPP	x	x	-	-
Coolpower	MCPA	-	x	x	-
Horsepower	MCPA	-	x	x	-
Tenacity	-	-	-	-	meso
Trimec Classic	MCPP	x	x	-	-
Trimenc Plus	MCPP	x	-	-	MSMA
Trimec 889	MCPA	x	x	-	-
Turflon Ester	-	-	-	x	-
WBG/Chickweed, clover...	-	-	-	x	-
WBG Max	MCPP	x	x	-	-
WBG Max - 25% more..	MCPA	-	x	x	-
WBG Max + Crabgrass	MCPP	x	x	-	quin
Weed Stop for Lawns2X	MCPP	x	x	-	sulf
WS for L + Crabgrass	-	x	x	-	sulf+quin

Abbreviation: dic=dicamba, meso=mesotrione, quin=quinclorac, sulf = sulfentrazone, tric = triclopyr, WBG = Weed B Gon.

MILLET

Aim (carfentrazone)
Callisto - Pearl millet
dicamba
fluroxypyr
Peak (prosulfuron)
2,4-D

MINT

Assure II (quizalofop)
Basagran (bentazon)
bromoxynil
Chateau (flumioxazin)
clethodim
clopyralid
Diuron/Karmex (diuron)
glyphosate - Preplant
oxyfluorfen
paraquat - Preplant
Poast (sethoxydim)
Prowl H2O (pendimethalin)
Spartan (sulfentrazone)

ONION

bromoxynil
clethodim
Dacthal (DCPA)
dimethenamid-P
Fusilade DX (fluazifop)
glyphosate - Preplant
Goal (oxyfluorfen)
paraquat - Preplant
Poast (sethoxydim)
Prefar (bensulide)
Prowl H2O (pendimethalin)
trifluralin

RYE

Aim (carfentrazone)
bromoxynil
glyphosate - Preplant
MCPA
Peak (prosulfuron)
2,4-D

SORGHUM

Aim (carfentrazone)
atrazine
Basagran (bentazon)
bromoxynil
Callisto (mesotrione)
dicamba
dimethenamid-P
fluroxypyr
G-Max Lite (atra&dimethenmd)
Intrro (alachlor)
S/metolachlor (metolachlor)
Micro-Tech (alachlor)
paraquat - Preplant
Paramount (quinclorac)
Peak (prosulfuron)
Permit (halosulfuron)
Priority (carfentrzn&halosulfrn)
Prowl H2O (pendimethalin)
Rage D-Tech (carfntrzn&2,4-D)
Sequence (glyt & metolachlor)
Yukon (dicamba&halosulfuron)
2,4-D

TRITICALE

Achieve (tralkoxydim)
Agility (dic&thif&trib&metsulfrn)
Aim (carfentrazone)
bromoxynil
chlorsulfuron
dicamba
DoubleUp B+G(brmxynl&2,4-D)
ET (pyraflufen)
Far-Go (triallate)
Finesse (chlor & metsulfuron)
fluroxypyr
metsulfuron
metsulf & thifensulf & tribenuron
Peak (prosulfuron)
Rhomene (MCPA)
thifensulfuron & tribenuron
tribenuron
2,4-D