


SUGARBEET

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
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Refer to page 6 for Fall or Spring Early Preplant Herbicides (See M6 to M9 for fall-applied herbicides).
Refer to page 45 for additional herbicides to use in conventional or herbicide-resistant sugarbeet.

Soil-Applied Herbicides

Far-Go (triallate ⁸) 	1.5 qt EC, 15 lb 10G (1.5 lb)	Wild oat.	PPI. Spring. Fall - see label for rates and timing.	Incorporate immediately after application. A second incorporation will improve wild oat control. A1-2 M1-2,7
Eptam (EPTC ⁸)	2.3 to 3.4 pt EC (2 to 3 lb)	Annual grasses and some broadleaf weeds.		Eptam may cause some sugarbeet stand reduction and temporary stunting. A1-2 B1 M1-2 M5-6 M18 S3
Eptam (EPTC⁸) + Ro-Neet SB (cycloate ⁸)	1.1 to 2.3 pt EC + 2.7 to 3.3 pt EC (1 to 2 + 2 to 2.5 lb)			Less sugarbeet injury than from Eptam alone. Refer to narrative for suggested rates for various soil textures and organic matter. A1-2 M1-2 M5-6 M18 S3
Ro-Neet SB (cycloate ⁸)	4 to 5.3 pt EC (3 to 4 lb)			Ro-Neet is safer than Eptam. Weed control is poor on fine textured, high OM soils. A1-3 M1-2 M5-6 M18 S3
Nortron / generic ethofumesate⁸	6 to 7.5 pt SC (3 to 3.75 lb)	Pigweed, kochia, waterhemp.	PPI or PRE.	PPI improves weed control. Band application reduces cost and risk of carryover. A1 M1-2 M9 M18 S3 Y12

POST-Applied Herbicides

Nortron / generic ethofumesate⁸	3 to 12 fl oz SC (0.094 to 0.375 lb)	Improves control of kochia, pigweed, waterhemp, and lambsquarters.	POST with Betamix or UpBeet and glyphosate up to 90 days PHI.	Apply Norton* POST 3 times at 4 fl oz/A or 4 times at 3 fl oz/A but do not apply POST more than 12 fl oz/A total during the growing season due to crop rotation restrictions. 90 day PHI. M1-2 M8-9 M15 M18 Y11 Y15
Stinger / generic clopyralid ⁴	4 to 10.6 fl oz SL (0.09 to 0.25 lb)	Cocklebur, marshelder, ragweed, sunflower, buckwheat, and Canada thistle.	POST. Sugarbeet: Cotyledon up to 8-leaf stage.	Refer to narrative for rates and sizes for various species. Stinger* may be tank-mixed with Betamix*. Allow a 45 day PHI. M1-2 M8 M12 M15 S1 S8-10
UpBeet (triflusalufuron ²)	0.25 to 1 oz DF (0.125 to 0.5 oz)	Annual broadleaf weeds.	POST. Weeds: Cotyledon to 2-leaf stage.	Do not exceed 2.5 oz/A/season. Must include MSO adjuvant at 2 pt/A unless prohibited. Allow a 60 day PHI. M1-2 M8 M11 M15
Betamix (desmedipham ⁵ & phenmedipham ⁵)	0.75 to 7.5 pt EC 0.06 to 0.6 lb + 0.06 to 0.6 lb	Annual broadleaf weeds.	POST. Sugarbeet: Cotyledon up to 75 days PHI.	Risk of sugarbeet injury increases from morning or midday applications and in certain environments. Split application with reduced rates has reduced sugarbeet injury and increased weed control compared to a single full-dose application. Do not add MSO or any adjuvant when applying full rates.
Betamix + Nortron* (desmedipham ⁵ & phenmedipham ⁵ + ethofumesate ⁸)	0.52 to 4.6 pt EC + 3 to 12 fl oz SC (0.042 to 0.374 lb + 0.042 to 0.374 lb + 0.094 to 0.375 lb)		Broadleaf weeds: Cotyledon up to 4-leaf stage.	Refer to paragraph for rate adjustment information. Allow a 75 day PHI. M1-2 M3 M8-9 M15 M18
Betamix ^{5,5} + UpBeet ² + Stinger ^{4*} + MSO adjuvant or Betamix ^{5,5} + Nortron ^{8*} + UpBeet ² + Stinger ^{4*} + MSO adjuvant	MICRO-RATE PROGRAM 8 to 12 fl oz + 0.125 oz + 1.3 fl oz + 2 pt/A or 8 to 12 fl oz + 3 to 4 fl oz + 0.125 oz + 1.3 fl oz + 2 pt/A. MID-RATE PROGRAM 12 to 16 fl oz + 0.125 oz + 1.3 fl oz + 2 pt/A or 12 to 16 + 3 to 4 fl oz + 0.125 oz + 1.3 fl oz + 2 pt/A.	Annual broadleaf weeds and fair to good annual grass control. Generally provides poor control of ALS-resistant kochia. Increasing clopyralid rate from 1.3 to 2.6 fl oz will improve control of lanceleaf sage with some risk of increased sugarbeet injury.	POST. Sugarbeet: Apply a minimum of three times with subsequent treatments at 5 to 7 day intervals. Micro-rate can be applied starting at cotyledon sugarbeet stage. Mid-rate can be applied starting at 4-leaf sugarbeet stage.	Use mid-rate for difficult weed problems or when application has been delayed. A herbicide for grass control at 1/2 to 1X normal rate can be added. Nozzle plugging from herbicide precipitation in the spray tank can be reduced by: - mixing in warm water - raising water pH to 8 or 9 - premixing UpBeet - adding a grass herbicide - frequent sprayer cleaning. Allow a 75 day PHI or 90 day PHI using Nortron. M1-3 M8-9 M11-12 M15


*Or generic equivalent.

POTATO

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
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Refer to page 6 for Fall or Spring Early Preplant Herbicides.

Soil-Applied Herbicides

Eptam (EPTC ⁸)	3.5 to 9 pt EC 15 to 30 lb 20G (3 to 6 lb)	Grass and some broadleaf weeds.	PPI, Dragoff, or Directed spray at layby.	Incorporate immediately after application at 4 to 6 inches deep. Poor wild mustard control. Adjust rate for soil type. Allow a 45 day PHI. May be applied with metribuzin at 0.33 to 0.67 lb DF/A. A1-2 B1 F2 N1 S3
	5.25 to 7 pt EC 22.5 to 30 lb 20G (4.5 to 6 lb)		Fall: Incorporate after October 15 until freeze-up.	
Treflan / generic trifluralin ³	1 to 2 pt EC 0.8 to 1.7 lb 60DF (0.5 to 1 lb)		Postplant incorporate (PoPI).	Adjust rates for soil type. Poor wild oat and no wild mustard control. Incorporate above the seed piece after planting or immediately following drag-off or hilling but before potato and weed emergence. Sonalan labeled only west of Hwy 281.
Sonalan (ethalfluralin ³)	1.33 to 2.67 pt EC (0.5 to 1 lb)			
Prowl Prowl H2O (pendimethalin ³)	1.75 to 3.6pt 3.3EC 1.5 to 3 pt 3.8ACS (0.72 to 1.5 lb)		PRE or EPOST. Potato: Before 6 inches tall.	Incorporation improves consistency of weed control.
Outlook / generic dimethenamid ¹⁵	16 to 21 fl oz EC (0.75 to 1 lb)		PRE. PHI: 40 days.	Only one application allowed.
Dual/II/Magnum (S/metolachlor ¹⁵)	1 to 2 pt EC (1 to 2 lb)	PPI or PRE. PHI: 40 days	Commercial mixture with metribuzin available as Boundary. A1-2 B1 B7 E10 N1 S3 Y1 Y15	
Lorox Linex (linuron ⁷)	 1 to 3 lb DF (0.5 to 1.5 lb) 1.5 to 3 pt L (0.75 to 1.5 lb)	Annual grass and broadleaf weeds.	PRE to potato. Small grass and broadleaf weeds.	Seed piece must be planted at least 2 inches deep. Apply after drag-off or hilling. Use higher rates for fine-textured soils. Apply with NIS at 1 qt/100 gal water to emerged weeds. A1-2 N1
Metribuzin ⁵	0.33 to 1.33 lb DF 0.5 to 2 pt 4F (0.25 to 1 lb)	Annual broadleaf weeds and grass suppression.	PRE to potato.	Apply after planting and before potato emergence or after drag-off. Do not incorporate. Adjust rate according to soil type. Commercial mixture with metolachlor available as Boundary. A1-2 E6 N1 N3 Y1 Y4 Y11 Y15
	0.33 to 0.67 lb DF 0.5 to 1 pt 4F (0.25 to 0.5 lb)		POST. Weeds: Up to 1 inch tall. PHI: 60 days.	Only for russet type or white skinned varieties that are not early maturing. Do not use on early maturing, smooth skinned white or red-skinned varieties or Atlantic, Shepody, Chipbelle, Bellchip, or Centennial varieties. Soil residue may injure crops the following year. A1-2 E6 N1 N3 Y1 Y4 Y11 Y15
Chateau (flumioxazin ¹⁴)	1.5 oz WDG (0.77 oz)	Annual broadleaf weed control.	PRE to potato.	Apply after planting and before potato emergence. Seed piece must be planted at least 2 inches deep. Refer to label for use instructions. A1-2 E12 S1 S6-11
Reflex / generic fomesafen ¹⁴	0.75 pt EC (0.188 lb)		PHI for Reflex: 70 days.	Apply after planting and before potato emergence. Use is restricted to east of Hwy 281. Do not apply PPI or POST to potato. Refer to label for other restrictions. A1-2 E4 N4 S6-11 Y10 Y15

POTATO

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
Matrix / generic rimsulfuron ²	1 to 1.5 oz DF (0.25 to 0.375 oz)	Annual grass and small broadleaf weeds. Suppression of lambsquarters and Canada thistle.	PRE to potato and weeds. After hilling or drag-off.	Requires precipitation after application for soil activation. Apply with soil-applied herbicides or in PRE /POST sequential applications.
			POST. Potato: Up to 14 inches tall. Annual weeds: Small.	Apply with oil adjuvant at 1 to 2 pt/A. Refer to label for application information and restrictions. A3 A5-8 N1-2 Y3 Y15
Matrix / generic rimsulfuron ² + Metribuzin ⁵	1 to 1.5 oz DF + 0.33 to 0.75 lb DF 0.5 to 1.12 pt 4F (0.25 to 0.375 oz + 0.25 to 0.56 lb)	Annual grass and quackgrass suppression and small broadleaf weeds including kochia, lambsquarters, wild buckwheat.	PRE to potato and weeds. After hilling or drag-off but before potato emerge.	Refer to label for varietal restrictions. Injury may occur when metribuzin is applied POST to early maturing smooth-skinned white and all red-skinned potato varieties - use only the low rate of metribuzin and consider benefits of weed control vs risk of potato injury prior to application to "at risk" varieties. Allow a 60 day PHI. Use the low rate of metribuzin when applied PRE to coarse textured soil. A3 A5-7 E6 N1-2 Y1 Y3-4 Y15
	1 to 1.5 oz DF + 0.25 to 0.67 lb DF 0.38 to 1 pt 4F (0.25 to 0.375 oz + 0.188 to 0.5 lb)		POST. Potato: Up to 14 inches tall. Annual weeds: Small.	
2,4-D LV4 ⁴ 2,4-D LV6 ⁴ (Use registered brands - See N5)	2.3 fl oz EC 1.6 fl oz EC (1.2 oz)	Broadleaf weeds suppression. Enhance and retain red color on skin.	Pre-bud - make sequential application 10 to 14 days later. PHI = 45 days.	Use on red potatoes grown for fresh market. Crop response may vary depending on variety, stress, and local conditions. Apply at 25 gpa by ground and 5 gpa aerially. Tank-mixtures with other pesticides and additives may increase risk of injury. A3 A6 N1 N5
Poast (sethoxydim ¹)	0.5 to 1.5 pt EC (0.1 to 0.3 lb)	Annual grasses.	POST. PHI: 30 days.	Add oil adjuvant at 1 gal/100 gal water but not less than 1.25 pt/A. Refer to label for tank-mix options.
Select Max 1EC Select 2EC Shadow 3EC (clethodim ¹)	9 to 16 fl oz EC 4 to 8 fl oz EC 2.66 to 5.33 EC (1 to 2 oz)	Annual grasses and quackgrass.	Grass weeds: Refer to soybean section on page 27.	Refer to Remarks in the POST grass herbicide section under Soybean for methods to avoid antagonism and reduced grass control from broadleaf herbicides. May be tank-mixed with metribuzin. A3 A5-6 E2 N1

POTATO VINE DESICCATION

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
Reglone / generic diquat ²² + NIS	1 to 2 pt SL+ 2 qt/100 gal water (0.25 to 0.5 lb)	Desiccant.	PHI: Reglone = 7 days. Firestorm = 3 days Rely = 9 days. Aim = 7 days. Vida = 5 days.	Add oil adjuvant at 1 to 2 pt/A. Most active in hot, sunny conditions. Reglone/diquat at 2 pt/A can be applied to all potatoes varieties and seed potato. Sequential application may be made up to a total of 4 pt/A. Allow at least 5 days between applications. Paraquat use is for fresh market potatoes ONLY. Do not use paraquat on potatoes that will be stored or used as seed pieces. B11
Firestorm + NIS (paraquat ²²) RUP	0.7 to 1.35 pt 3SL + 2 qt/100 gal water (0.25 to 0.5 lb)			
Rely 280 + AMS (glufosinate ¹⁰)	21 fl oz SL + 3 lb/A (0.38 lb)			
Aim (carfentrazone ¹⁴)	3.2 to 5.9 fl oz EW (0.8 to 1.6 oz)			
Vida (pyraflufen ¹⁴)	2 to 5.5 fl oz EC (0.05 to 0.14 oz)			
Sulfuric acid RUP	20 gal SL			

ALFALFA ESTABLISHMENT, No Companion Crop

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraph
Refer to page 6 for Fall or Spring Early Preplant Herbicides.				
Refer to page 49 for additional herbicides to use in conventional or herbicide resistant alfalfa.				
Eptam (EPTC ⁸)	2 to 4.5 pt EC 10 to 20 lb 20G (1.75 to 4 lb)	Grass and some broadleaf weeds.	PPI.	Poor wild mustard control. Incorporate immediately after application. The 2 pt/A rate can be used on all varieties. A1-2 B1 F2 P1
Treflan / generic trifluralin ³	1 to 1.5 pt EC (0.5 to 0.75 lb)			Alfalfa stand reduction/stunting possible but reduced weed competition will help alfalfa establishment. P1
Prowl H₂O (pendimethalin ³)	1 to 2 pt EC (0.48 to 0.95 lb)	Annual grass and some broadleaf weed.	PRE to weeds. Alfalfa: <6 inches of regrowth.	Allow a 50 day PHI. Refer to label for use instructions. A1-2 B1 B7 E10 P1 Y13 Y15
2,4-DB ⁴ ester 2,4-DB ⁴ amine	2 to 4 pt 2EC/SL (0.5 to 1 lb ae)	Small broadleaf weeds.	Alfalfa: More than 2 trifoliolate leaves. Weeds: <3 inches.	Sweetclover may be killed by 2,4-DB. Poor wild mustard control. No absinth wormwood control. Allow a 60 day PHI or grazing interval. P1
Bromoxynil⁶ For Alfalfa Only	1 to 1.5 pt EC (0.25 to 0.38 lb)		Alfalfa: At least 4 trifoliate. Weeds: Small.	Sweetclover may be killed. Alfalfa injury may occur if temperature within 3 days of application exceeds 80F in the western half or 70F in the eastern half of ND. Can be tank-mixed with Pursuit or Raptor. P1
Pursuit (imazethapyr ²) For Alfalfa Only	3 to 4 fl oz SL (0.75 to 1 oz ae)	Small annual broadleaf and grass weeds. Poor yellow foxtail, lambsquarters, ragweed, and buckwheat control. No perennial weed control.	Fall or Spring. POST: Alfalfa: At least 2 trifoliate.	Apply to seedling, established, dormant, actively growing alfalfa or between cuttings. Excellent alfalfa safety. Add MSO at 1.5 pt/A + UAN at 1 to 2 qt/A. Can be tank-mixed with Buctril/bromoxynil or Poast. A3 A5-8 E7 E9 P1 Y2 Y15
Raptor (imazamox ²) For Alfalfa Only	4 to 6 fl oz SL (0.5 to 0.75 oz ae)		Weeds: 1- to 3-inches tall.	
Poast (sethoxydim ¹)	0.5 to 1.5 pt EC (0.19 to 0.28 lb)	Annual grasses.	POST. Alfalfa: Allow a 15 days PHI.	May be applied to alfalfa and sainfoin. Add oil adjuvant at 1 gal/100 gal water but not less than 1.25 pt/A. Refer to label for tank-mix options.
Select Max 1EC Select 2EC Shadow 3EC (clethodim ¹)	9 to 16 fl oz EC 4 to 8 fl oz EC 2.66 to 5.33 EC (1 to 2 oz)	Annual grasses and quackgrass.	Grass weeds: See soybean section on page 27.	Refer to Remarks in the POST grass herbicide section under Soybean for methods to avoid antagonism and reduced grass control from broadleaf herbicides. A3 A5-6 E2

HERBICIDE RESISTANT ALFALFA

Refer to page 48-49 for additional herbicides to use in conventional or herbicide resistant alfalfa.

Roundup Ready Alfalfa - Established

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
Glyphosate ⁹	Maximum single application = 1.56 lb ae Maximum in-crop = 4.5 lb ae See Remarks.	Emerged annual and perennial grass and broadleaf weeds.	RR Alfalfa: Emergence to 5 days prior to any cutting (PHI). Apply as a single application or multiple applications at least 7 days apart.	Apply only to glyphosate resistant alfalfa. Add AMS fertilizer at 8.5 lb/100 gal. Multiple applications may be necessary to control weed flushes. Refer to label for weeds controlled, application information, tankmix options with residual herbicides, and restrictions. A3-7 B8 P1

ALFALFA - ESTABLISHED

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs																														
Paraquat ²² + NIS RUP	2 to 3 pt 2SL 1.3 to 2 pt 3SL (0.5 to 0.75 lb)	Small annual and early germinating weeds.	Alfalfa: Before spring regrowth is 2 inches tall.	Apply to well established stands, at least 1 year old, after dormancy but before spring regrowth reaches 2 inches. Allow a 60 day PHI or grazing interval. B11 P1																														
	1 pt 2SL 0.7 pt 3SL (0.25 lb)	Larger weeds.	Between cuttings - includes first-year alfalfa.	Apply up to 5 days after cutting. Allow a 30 day PHI. May be applied to dormant alfalfa. B11 P1																														
Sharpen + MSO adjuvant (saflufenacil ¹⁴)	1 to 2 fl oz SC + 1 to 1.5 pt (0.36 to 0.72 oz)	Broadleaf weeds.	Established and dormant alfalfa: Fall or spring. Weeds: Small.	Do not apply Sharpen to alfalfa grown for seed because reduced germination/vigor may occur. Apply at 10 gpa or greater. Allow a 28 day PHI. Refer to label for use and tank-mix instructions.																														
Treflan / generic trifluralin ³	1.5 to 2 pt EC (0.75 to 1 lb)	Annual grass and some broadleaf weed.	Weeds: Prior to emergence.	Apply when crop is dormant, or in fall after a cutting. Incorporate by irrigation or mechanical equipment. A1-2 B7 P1																														
Prowl H ₂ O (pendimethalin ³)	1 to 2 pt ASC (0.48 to 0.95 lb)		Weeds: PRE. Alfalfa: 2 to 6 inches of regrowth.	Allow a 50 day PHI. Refer to label for use instructions. A1-2 B1 B7 E10 P1 Y13 Y15																														
Chateau (flumioxazin ¹⁴)	<4 oz / application (<2 oz) <8 oz / season (<4 oz)	Small-seeded broadleaf weed.	PRE to weeds. Alfalfa: <6 inches of regrowth.	Separate sequential Chateau applications by at least 60 days. Apply soon after cutting and removing alfalfa to minimize alfalfa injury. Refer to label for use instructions. A1-2 B1 E12 P1 S1 S6-11																														
2,4-DB ⁴ ester 2,4-DB ⁴ amine	2 to 4 pt EC 2 to 4 pt SL (0.5 to 1.0 lb ae)	Broadleaf weeds.	Weeds: Less than 3 inches tall.	Sweet clover may be killed by 2,4-DB. No wild mustard or absinth wormwood control. Allow a 30 day hay, harvest or grazing interval. P1																														
Pursuit (imazethapyr ²)	3 to 4 fl oz SL (0.75 to 1 oz ae)	Small annual broadleaf and grass weeds.	POST. Alfalfa: At least 2 trifoliates. Weeds: 1- to 3-inches tall.	For alfalfa and clover Only. Excellent alfalfa safety. Add oil additive at 1.5 to 2 pt/A + UAN at 1 to 2 qt/A. No absinth wormwood control. Can be tank-mixed with bromoxynil or Poast. A1 A3 A5-6 E7 E9 P1																														
Raptor (imazamox ²)	4 to 6 fl oz SL (0.5 to 0.75 oz ae)																																	
Poast (sethoxydim ¹)	0.5 to 1.5 pt EC (0.2 to 0.3 lb)	Annual grasses.	Grass. Alfalfa: PHI:15 days. Grass weeds: Refer to soybean section on page 27.	Add oil adjuvant at 1 gal/100 gal water but not less than 1.25 pt/A. Refer to label for tank-mix options. Refer to Remarks in the POST grass herbicide section under Soybean for methods to avoid antagonism and reduced grass control from broadleaf herbicides. Apply in two sequential applications for quackgrass control. A3-7 B2 P1																														
Select Max 1EC Select 2EC Shadow 3EC (clethodim ¹)	9 to 16 fl oz EC 4 to 8 fl oz EC 2.66 to 5.33 EC (1 to 2 oz)	Annual grasses and quackgrass.																																
Glyphosate ⁹	0.75 to 1.5 lb ae See Remarks.	Alfalfa and emerged grass and broadleaf weeds.	Apply in spring or fall for quackgrass control.	<table style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;"><u>0.75 lb ae</u></td> <td style="text-align: center;"><u>1.125 lb ae</u></td> <td style="text-align: center;"><u>1.5 lb ae</u></td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">lb ae/gal</td> <td style="text-align: center;">lb ai/gal</td> <td style="text-align: center;">fl oz</td> <td style="text-align: center;">-----</td> </tr> <tr> <td></td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">32</td> <td style="text-align: center;">48</td> </tr> <tr> <td></td> <td style="text-align: center;">4.5</td> <td style="text-align: center;">5.5</td> <td style="text-align: center;">21.3</td> <td style="text-align: center;">32</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">64</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">42.6</td> </tr> </table> <p>Apply where crop destruction is acceptable. Treated crop and weeds can be harvested and fed >36 hours after treatment. Apply with AMS fertilizer at 8.5 lbs/100 gal. A3-7 B8</p>		<u>0.75 lb ae</u>	<u>1.125 lb ae</u>	<u>1.5 lb ae</u>			lb ae/gal	lb ai/gal	fl oz	-----		3	4	32	48		4.5	5.5	21.3	32					64					42.6
	<u>0.75 lb ae</u>	<u>1.125 lb ae</u>	<u>1.5 lb ae</u>																															
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