

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.

Refer to page 29-31 for additional herbicides to use in conventional or herbicide-resistant soybean.

Soil-Applied Herbicides

Prowl Prowl H2O (pendimethalin ³)	2.4 to 3.6 pt EC 2.1 to 3 pt ACS (1 to 1.5 lb)	Annual grass and some broadleaf weeds.	PPI. Fall or Spring.	Adjust rate for soil type. Do not apply PRE. Poor control of weeds with large seeds, including wild oat and wild mustard control. A1-2 B1 B7 E1 E11 S3 Y15
Sonalan Sonalan 10G (ethalfluralin ³)	1.5 to 3 pt EC 5.5 to 11.5 10G (0.55 to 1.15 lb)			
Treflan / generic trifluralin ³	1 to 2 pt EC (0.5 to 1 lb)			
Valor SX Valor EZ (flumioxazin ¹⁴)	2 to 3 oz WDG 2 to 3 fl oz SC (1.02 to 1.53 oz)	Small-seeded broadleaf weeds.	EPP, Shallow PPI, or PRE.	PRE requires precipitation for herbicide activation. Refer to label for tank-mix options, application information, and restriction. Commercial mixtures available (See page 30): Afforia = flumioxazin + thifensulfuron + tribenuron Authority Assist = sulfentrazone + imzethapyr Authority Elite = sulfentrazone + S-metolachlor Authority First = sulfentrazone + cloransulam Authority MTZ = sulfentrazone + metribuzin BroadAxe XC = sulfentrazone + S-metolachlor Fierce = flumioxazin + pyrozasulfone Sonic = sulfentrazone + cloransulam Surveil = flumioxazin + cloransulam A1-2 B1-2 E1 E12-13 Y15
Spartan (sulfentrazone ¹⁴)	4.5 to 12 fl oz F (2.25 to 6 oz)			
Metribuzin ⁵	Soil pH >7.5 = 0.33 lb DF Soil pH <7.5 = 0.33 to 0.5 lb DF			
Sharpen (saflufenacil ¹⁴)	1 to 1.5 fl oz SC (0.36 to 0.54 oz)	Broadleaf weeds including winter annuals.		PRE requires precipitation for herbicide activation. Apply with MSO adjuvant at 1 to 1.5 pt/A for burndown control of emerged broadleaf weeds. Planting interval is dependant on soil texture and OM. Sharpen at 1.5 fl oz and Verdict at 7.5 fl oz require a 14 day plantback interval. Refer to label for tank-mix options. A1-2 B1-2 B12 S1-13 Y15
Verdict (saflufenacil ¹⁴ & dimethenamid ¹⁵)	5 to 7.5 fl oz EC (1.3 to 0.53 oz & 0.9 to 1.34 lb)			
Dual/II/Magnum (S/metolachlor ¹⁵)	1 to 2 pt EC (0.95 to 1.9 lb)	Annual grasses and some broadleaf weeds.	EPP, Shallow PPI, PRE and EPOST. POST PHI: Dual = 90 days.	Requires precipitation for soil activation. Multiple rain events increase activation of pyroxsulfone. Provides 3 to 4 weeks residual weed control after activation. Adjust rate for soil type. Shallow PPI gives more consistent weed control than PRE. Use highest rates for greater and more consistent weed control. Warrant: Do not PPI. Application with other PRE or EPOST herbicides and stress environment after application may increase risk of soybean injury. Refer to labels for tank-mix options. Commercial mixtures available (See page 30): Authority Elite = S-metolachlor + sulfentrazone Boundary = S-metolachlor + metribuzin BroadAxe XC = S-metolachlor + sulfentrazone Fierce = pyrozasulfone + flumioxazin Zidua Pro = pyrozasulfone + saflufenacil + imazethapyr A1-2 B1-2 D5 E1 F3
Outlook / generic dimethenamid ¹⁵	16 to 21 fl oz EC (0.75 to 1 lb)			
Warrant (acetochlor ¹⁵ - microencapsulated)	1.25 to 2 qt ME (0.94 to 1.5 lb)			
Anthem Maxx (pyrozasulfone ¹⁵ & fluthiacet ¹⁴)	2 to 5.5 fl oz SC (1 to 2.87 oz & 0.03 to 0.087 oz)			
Zidua (pyrozasulfone ¹⁵)	1 to 3.5 oz WDG (0.85 to 3 oz)			

SOYBEAN

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
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Refer to page 29-31 for additional herbicides to use in conventional or herbicide-resistant soybean.

POST-Applied Herbicides

Warrant (acetochlor ¹⁵ - microencapsulated)	1.25 to 2 qt ME (0.94 to 1.5 lb)	PRE control of grass and broadleaf weeds.	POST. Soybean: After emergence until R2.	Rainfall required for PRE activation. Does not control emerged weeds. Provides residual weed control after activation. No adjuvant required. A1-2 E1 D5
Basagran 5L / generic bentazon ⁶ + MSO adjuvant	0.4 to 1.6 pt SL / 0.5 to 2 pt applied 1 to 4 times. (0.25 to 1 lb)	Some broadleaf weeds.	POST. Soybean: After emergence. Broadleaf weeds: Small.	Non-residual, contact herbicide requiring >15 gpa and full sunlight. Add MSO adjuvant at 1 to 1.5 pt/A. Maximum bentazon amount per season is 2 lb/A. Refer to E3 for additional information. A3 A5-6 E1 E3 F6 S6-12
Cadet (fluthiacet ¹⁴)	0.4 to 0.9 fl oz EC (0.045 to 0.1 oz)	Some small broadleaf weeds including pigweed species.	POST. Soybean: 1 to 2 trifoliates. Weeds: Small.	Contact herbicides requiring small weed size, >15 gpa, NIS or oil adjuvant at 1 to 2 pt/A, and full sunlight. May cause speckling on soybean leaves. Cadet may improve lambsquarters control. Apply Cobra with oil adjuvant at 1 to 2 pt/A. Refer to label for crop response, adjuvant type and rate, and tank-mix options. A3 E1 S10-11
Cobra (lactofen ¹⁴)	8 to 12.5 fl oz EC (2 to 3.2 oz)			
Resource (flumiclorac ¹⁴)	2 to 8 fl oz EC (0.215 to 1.72 oz)			
Ultra Blazer (acifluorfen ¹⁴)	0.5 to 1.5 pt EC (0.125 to 0.375 lb)			
Flexstar / generic fomesafen ¹⁴ + oil adjuvant ND State SLN Pending for use west of Hwy 281	0.75 pt EC (0.176 lb)	Many small broadleaf weeds. Poor buckwheat, lambsquarters and hairy nightshade control.	POST Soybean: Prior to flowering. Weeds: Small. Do not use as a rescue treatment. Contact herbicide requiring small weed size.	Apply at >15 gpa, oil adjuvant at 1 to 2 pt/A, and full sunlight. MSO at 1 to 2 pt/A + AMS at 8.5 lbs/100 gal water will increase weed control and risk of crop injury. Apply at 1 pt/A in ND east of I-29 and south of I-94. Apply at 0.75 pt/A in ND east of Hwy 281 and in the following counties west of Hwy 281: Benson, Bottineau, Burleigh, Dickey, Eddy, Emmons, Foster, Grant, Kidder, LaMoure, Logan, McHenry, McIntosh, McLean, Mercer, Morton, Oliver, Pierce, Renville, Rolette, Sheridan, Sioux, Stutsman, Towner, Ward, and Wells. West of Hwy 281: - Do not apply to soil with OM >4%. - Do not apply after June 20. Refer to product label and ND SLN label for crop rotation restrictions and other restrictions. Refer to E4 for improved broadleaf weed control. A3 E1 E5 S6 S8-11 Y10 Y15
FirstRate (cloransulam ²)	0.3 oz WDG or 10 A/pack (0.25 oz)	Large-seeded broadleaf weeds.	POST. Soybean: Up to full flower stage (R2). Weeds: Small.	Add oil adjuvant at 1 to 2 pt/A + 28% UAN at 2.5% v/v. Refer to label for weed size, and tank-mix options. A3 E1 Y2 Y15
Harmony / generic thifensulfuron ²	0.083 (1/12) oz DF 0.125 (1/8) oz SG (0.062 oz)	Mustard, pigweed, and lambsquarters.	POST. Soybean: 1 st trifoliolate until 60 days PHI.	Add oil additive at 1 to 2 pt/A + 28% UAN or AMS. Refer to label for tank-mix options. A3 A5-8 E1 E6 S7
Pursuit (imazethapyr ²)	2 to 3 fl oz SL (0.5 to 0.75 oz)	Annual broadleaf weeds. Poor lambsquarters, ragweed,	POST. Soybean: Prior to flowering.	Add oil adjuvant at 1 to 2 pt/A + 28% UAN at 2.5% v/v. MSO adjuvants enhance weed control more than petroleum oil or NIS adjuvants. Refer to label for weed size and application information. Raptor has less soil residual carryover than Pursuit. A3 A5-8 E1 E8 E10 S8 Y2 Y15
Raptor (imazamox ²)	4 to 5 fl oz SL (0.5 to 0.625 oz)	buckwheat and b. wormwood control.	Weeds: Small and actively growing.	
Varisto (bentazon ⁶ & imazamox ²)	11 to 27 fl oz SL (0.34 to 0.84 lb + 0.26 to 0.64 oz)	Small annual grass and broadleaf weeds and suppression of Canada thistle.	Allow a 30 day PHI.	Add MSO adjuvants at 1.25 to 1.5 pt/A. Apply 11 fl oz to pre-bolt canola. Refer to E3 for additional information. A3 A5-8 E1 E3 E10 S1-13 T3 Y15

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
Refer to page 29-31 for additional herbicides to use in conventional or herbicide-resistant soybean.				
Assure II Targa (quizalofop ¹)	4 to 12 fl oz EC (0.44 to 1.32 oz)	Annual grasses and quackgrass.	Soybean: Prior to pod set. Grass weeds: Refer to table below.	Add oil adjuvant at 1 gal/100 gal water but not less than 1.25 pt/A. Use highest rate of Assure II for yellow foxtail control. Grass control is reduced by tank mixtures or close interval application of POST broadleaf control herbicides. Antagonism generally can be avoided by applying a higher rate of grass herbicide or apply the grass control herbicide 1 or more days before or 7 days after the broadleaf control herbicide. Do not cultivate prior to 5 days before or 7 days after application. Refer to label for tank-mix options. Refer to page 111 for control of volunteer canola and corn. A3 A5-7 E1-2
Fusilade DX (fluazifop ¹)	5 to 12 fl oz EC (1.25 to 3 oz)			
Poast (sethoxydim ¹)	0.5 to 1.5 pt EC (0.1 to 0.3 lb)	Annual grasses.	Soybean: All stages. Grass weeds: Refer to table below.	
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 Control with POST Herbicides

	Foxtail, green and yellow		Corn, volunteer (See page 111)		Quackgrass		Wheat, barley, oat, and sandbur		Proso millet, wild	
	inches	fl oz/A	inches	fl oz/A	inches	fl oz/A	inches	fl oz/A	inches	fl oz/A
Assure II/Targa ¹	2 to 4	7 to 8	6 to 30	5 to 8	6 to 10	12	2 to 6	7 to 8	2 to 6	5 to 8
Fusilade DX ¹	2 to 4	10 to 12	12 to 24	4 to 6	6 to 10	12	2 to 6	8	4 to 8	6
Poast ¹	2 to 8	1 pt	1 to 20	1 pt	6 to 8	2 pt	1 to 4	1 pt	4 to 10	0.5 pt
Select Max 1EC ¹	2 to 8	9 to 12	4 to 24	9 to 12	4 to 12	12	2 to 6	9	2 to 10	9
Select 2EC ¹	2 to 8	4 to 6	4 to 24	6	4 to 12	8	2 to 6	6	2 to 10	4 to 6
Shadow 3EC ¹	2 to 8	2.66-5.33	4 to 24	2.66-5.33	4 to 12	5.3-10.6	2 to 6	4 to 5.33	2 to 10	4 to 5.33

Preharvest Application

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
Glyphosate ⁹	Up to 1.5 lb ae See Remarks.	Preharvest weed control - broadcast or spot application.	Prior to harvest. Apply when soybean seed pods are a mature brown color, >75% leaf drop, and <30% seed moisture.	Add NIS plus AMS fertilizer at 8.5 lb/100 gal. Do not apply on soybean grown for seed because reduced germination/vigor may occur. A3-6 B8
Banvel / generic dicamba ⁴ + MSO adjuvant	Up to 32 fl oz SL + 1 qt/A (1 lb)			Do not apply on soybean grown for seed because reduced germination/vigor may occur. Add oil adjuvant at 1 to 2 pt/A. A3 A5-8 B6 E4
Paraquat ²² + NIS RUP	8 to 16 fl oz 2SL 5.4 to 10.7 fl oz 3SL (0.13 to 0.25 lb)	Desiccant.	PHI: RU = 7 days Dicamba = 7 days. Paraquat = 15 days Aim = 3 days Sharpen = 3 days	Contact herbicides require >15 gpa and full sunlight. Apply at >10/>5 gpa for ground/aerial application. Apply paraquat with NIS at 2 qt/100 gal water. Sharpen requires up to 10 days for optimum desiccation. Apply dicamba, Aim, and Sharpen with AMS at 8.5 lb/100 gal water or UAN at 2.5 gal/100 gal water. Do not apply Sharpen on soybean grown for seed because reduced germination/vigor may occur. B11-12
Aim + MSO adjuvant (carfentrazone ¹⁴)	1 to 1.5 oz SL + 1 qt/A (0.256 to 0.384 oz)			
Sharpen + MSO adjuvant (saflufenacil ¹⁴)	1 to 2 fl oz SC + 1 to 2 pt/A (0.36 to 0.72 oz)			

HERBICIDE-RESISTANT SOYBEAN

Refer to pages 29-31 for additional herbicides to use in conventional or herbicide-resistant soybean.

Refer to page 111 for control of volunteer glyphosate resistant corn, canola, and soybean.

Refer to Herbicide Resistant Weeds section (X1 - pages 96-97) for weed management strategies to delay herbicide resistant weeds.

Rule #1 - Control weeds BEFORE 2 to 4 inches tall to avoid yield loss.

Remove weeds early especially when grass weed populations are high.

ND soybean yield loss from weeds removed at different intervals.

Weed height when weeds were removed.	Soybean stage	Soybean yield* (bu/A)
Weed free	-	44.3
2 to 4 inches	VC (cotyledon) to V1	42.1
6 to 8 inches	V2 to V4	40.8
>10 inches	V3 to R2	36.4
Weedy check	-	22.7


Soybean yield loss from weeds may be greater in dry North Dakota environments than other areas of the mid-west that receive greater precipitation.

*Source: Greg Endres, Carrington R&E Center. 8-site years (2011-2014). Carrington, Doyon, Langdon, and Minot.

Roundup Ready and Roundup Ready 2 Yield Soybean

Herbicide	Product/A (ae/A)	Weeds	When to Apply	Remarks and Paragraphs																																																						
Glyphosate ⁹	Maximum single application = 1.5 lb ae Maximum in-crop = 2.25 lb ae See Remarks.	Annual and perennial grass and broadleaf weeds.	POST. Soybean: Emergence through R2 of full flowering. The R2 stage ends when a pod 3/16 inch long at one of the four uppermost nodes appears on the main stem along with a fully developed leaf (R3 stage). Allow a 14 day PHI.	Apply only to RR / RR 2 Yield soybean varieties. Cannot plant harvested patented soybean seed. <table border="1"> <thead> <tr> <th colspan="2"></th> <th colspan="4">lb ae</th> </tr> <tr> <th colspan="2"></th> <th>0.77</th> <th>0.84</th> <th>0.98</th> <th>1.125</th> </tr> <tr> <th>lb ae/gal</th> <th>lb ai/gal</th> <th colspan="4">fl oz</th> </tr> </thead> <tbody> <tr> <td>3 = 4</td> <td>= 33</td> <td>36</td> <td>42</td> <td>48</td> <td></td> </tr> <tr> <td>3.75 = 5</td> <td>= 26</td> <td>29</td> <td>34</td> <td>38</td> <td></td> </tr> <tr> <td>4/4.17 = 5.4/5.1</td> <td>= 25/24</td> <td>27/26</td> <td>31/30</td> <td>36/35</td> <td></td> </tr> <tr> <td>4.5 = 5.5</td> <td>= 22</td> <td>24</td> <td>28</td> <td>32</td> <td></td> </tr> <tr> <td>4.72 = 6.3</td> <td>= 21</td> <td>23</td> <td>27</td> <td>31</td> <td></td> </tr> <tr> <td>5 = 6.1</td> <td>= 20</td> <td>22</td> <td>25</td> <td>29</td> <td></td> </tr> </tbody> </table> Add AMS fertilizer at 8.5 lb/100 gal. Multiple applications may be necessary for weed flushes. Drift and off-site movement may cause injury or death to other plants and crops. Refer to label for weeds controlled, application information, and tank-mix options with residual herbicides and restrictions. A4-7 B8 D8 S1-13			lb ae						0.77	0.84	0.98	1.125	lb ae/gal	lb ai/gal	fl oz				3 = 4	= 33	36	42	48		3.75 = 5	= 26	29	34	38		4/4.17 = 5.4/5.1	= 25/24	27/26	31/30	36/35		4.5 = 5.5	= 22	24	28	32		4.72 = 6.3	= 21	23	27	31		5 = 6.1	= 20	22	25	29	
		lb ae																																																								
		0.77	0.84	0.98	1.125																																																					
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4/4.17 = 5.4/5.1	= 25/24	27/26	31/30	36/35																																																						
4.5 = 5.5	= 22	24	28	32																																																						
4.72 = 6.3	= 21	23	27	31																																																						
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Roundup Xtend Soybean

Herbicide	Product/A (ae/A)	Weeds	When to Apply	Remarks and Paragraphs
XtendiMax (dicamba ⁴) 	EPP or PRE 22 to 44 fl oz (0.5 to 1 lb ae) Single application rate in-crop: 22 fl oz (0.5 lb ae) Maximum total in-crop: 44 fl oz (0.5 lb ae) Maximum total/yr: 88 fl oz (2 lb ae) Do not apply less than 22 fl oz/A for any application.	Annual and perennial broadleaf weeds.	EPP, At Planting, PRE and POST. Soybean: Emergence through beginning bloom (R1 stage). Weeds: Less than 4 inches tall. Allow a 7 day PHI. Apply with TT11004 nozzles at <64 psi. Do not apply by aircraft.	Apply only to RU Xtend soybean varieties. Refer to: www.xtendimaxapplicationrequirements.com for nozzles allowed, herbicide and adjuvant tankmix options, herbicide resistant weed management, restrictions, and application information. - Do not deviate in use from label or web site (above). - Do not add any product containing ammonium. - Do not apply less than 10 gpa spray solution. - Do not apply at wind speed greater than 10 mph. - Do not exceed 15 mph application speed. - Do not exceed a boom height of 24 inches above target weed or canopy. - Do not apply before/during temperature inversions. - Do not apply when wind is blowing toward dicamba sensitive crops. - Maintain a 110 foot downwind buffer at 22 fl oz/A and a 220 foot buffer at 44 fl oz/A (See label for areas included in the distance calculation). - Follow label for tank clean-out procedures. Drift and off-site movement may cause injury or death to susceptible plants and crops. A3-8 B6 B8 D1 D3 D8 E1 E4 S1-13 Y9 Y15

Roundup Ready/STS (sulfonylurea-tolerant) Soybean

Herbicide	Product/A (ae/A)	Weeds	When to Apply	Remarks and Paragraphs
Refer to Roundup Ready soybean above for use of glyphosate in RR/STS soybean.				
Harmony / generic thifensulfuron ²	0.33 oz DF 0.5 oz SG (0.25 oz)	Annual broadleaf weeds including, wild buckwheat, lambsquarters, mustard species, and volunteer RR canola.	POST. RR/STS soybean: 1 st fully expanded trifoliolate to 60 days PHI.	Apply only to RUR/STS soybean varieties. Apply with glyphosate at 0.38 to 1.125 lb ae/A. Add NIS at 1 qt/100 gal water. Apply with AMS at 8.5 lb/100 gal water. Refer to label for weeds controlled and application information. A4-7 B8 D8 E6 S7

LibertyLink Soybean

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
Liberty 280 (glufosinate ¹⁰)	29 to 36 fl oz SL (0.53 to 0.65 lb) 1 st application: 29 to 36 fl oz. 2 nd application: 29 fl oz.	Annual grass and broadleaf weeds including ALS and glyphosate resistant weeds.	POST. Soybean: Emergence to pre-bloom. Weeds: Up to 3 inches tall.	Apply only to LibertyLink soybean varieties. Non-selective, contact, non-residual herbicide requiring thorough coverage. Apply a PRE foundation treatment prior to Ignite POST. Add AMS at 3 lb/A - do not use AMS replacement or water conditioner adjuvants. Can be applied with a registered grass herbicide. Refer to label for tank-mix options and restrictions. Most active in hot and sunny conditions. Controls weeds resistant to other herbicides. A3 A6 B9 D7 S1-13

Roundup Ready Soybean - Herbicides to apply in tank-mix or sequentially with glyphosate for control of weeds not controlled by glyphosate.

Refer to pages 25 through 28 for additional herbicides and information.

Herbicide ^a	Site of action-pg 98-99	Rate/A	Cost/A	Buckwheat, Wild	Canola, Vol. RR ^b	Horseweed (Marestail)	Kochia	Lambsquarters	Nightshade species	Pigweed, Redfoot	Prickly lettuce	Ragweed, Common	Smartweed, Annual	Waterhemp
Preplant-burndown herbicides^a - add AMS at 1.5-3 lb/A.				Weed Control Ratings^{c,d} - without glyphosate										
Glyphosate ⁹ (4.5 lb ae)+ AMS + HSOC		32-105 fl oz	\$7.00-25.00	F-E	N	P-E	P-E	E	E	E	E	P-E	E	P-E
+ 2,4-D ^{4e}		+ 1 pt	\$10.00	F-E	P-E	G-E	P-E	E	E	E	E	E	E	P-E
+ 2,4-D ^{4e} + Express		+ 1 pt + 0.3 oz	\$25.00	F-E	G-E	P-E	P-E	E	E	E	E	P-E	E	P-E
+ 2,4-D ^{4e} + Metribuzin ⁵		+ 1 pt + 0.33 lb	\$23.00	G-E	G-E	G-E	F-E	E	G-E	E	E	E	E	F-E
+ Afforia ^{2,14}		2.5-3.75 oz WDG	\$14.00-21.00	G-E	G-E	F-G	P-G	G-E	G-E	G-E	F-E	P	F	G
+ Verdict ^{14,15}		+ 5 fl oz	\$13.00	G-E	P-G	G-E	G-E	E	G-E	E	G-E	G-E	E	E
+ Verdict ^{14,15} + Metribuzin ⁵		+ 5 fl oz + 0.33 lb	\$22.00	E	G-E	E	E	E	E	E	E	E	E	E
+ Verdict ^{14,15} + Zidua ¹⁵		+ 5 fl oz + 2.5 oz	\$52.00	E	G-E	G-E	G-E	E	E	E	E	G-E	E	G-E
Paraquat ²² + NIS adjuvant		3 pt 2SL + 1-2 pt	\$20.00	F	-	F-G	G-E	E	G-E	E	F-G	G-E	E	G-E
+ Verdict ^{14,15} + Metribuzin ⁵ + oil adj.		+ 5 fl oz + 0.33	\$35.00	G-E	E	G-E	G-E	E	G-E	E	G-E	E	E	G-E
+ 2,4-D ^{4e} +Verdict ^{14,15} +Metrib ⁵ + oil adj.		+ 5 oz + 0.33 lb	\$32.00	E	E	E	E	E	E	E	E	E	E	E

PRE herbicides^a				Weed Control Ratings^{c,d} - without glyphosate										
Afforia ^{2,14}		2.5-3.75 oz WDG	\$10.00-12.00	G-E	G-E	F-G	P-G	G-E	G-E	G-E	F-E	P	F	G
Anthem Maxx ^{14,15}		2-5.5 oz	\$15.00-30.00	F-E	P-F	-	F-E	F-E	F-E	G-E	-	P	F-E	G-E
Authority Assist ^{2,14}		6-9 fl oz	\$18.00-27.00	P	P-E	F	F-E	G-E	F-E	F-E	E	N	G-E	F-E
Authority Elite ^{14,15}		20-32 fl oz	\$22.00-35.00	P-G	P-F	F	G-E	G-E	G-E	G-E	P	N	G-E	G-E
Authority First ^{2,14}		4-8 oz	\$22.00-44.00	P	E	P-E	F-E	G-E	F-E	F-E	P	N	G-E	F-E
Authority MTZ ^{5,14}		12-15* oz	\$21.00-26.00	F-G	E	F	F-E	G-E	G-E	G-E	G-E	F-G	G-E	F-E
Boundary ^{5,15}		1.6* -2.4** pt	\$18.00-27.00	F-G	E	F	F-G	G	P	G-E	G-E	P-F	G	G-E
BroadAxe XC ^{14,15}		20-32 fl oz	\$22.00-35.00	P-G	P-F	F	G-E	G-E	G-E	G-E	P	N	G-E	G-E
Fierce ^{14,15}		3 oz	\$24.00	G-E	G-E	F-G	F-E	F-E	G-E	G-E	F-G	P	F-G	G-E
FirstRate ²		0.3-0.75 WDG	\$13.00-33.00	N	E	P-E	N	P-F	N	P-F	-	P	G-E	N
Metribuzin ⁵		0.33-0.5 lb	\$6.00-9.00	F-G	E	F	F-G	P-G	P	G-E	G-E	P-F	G	F-G
Prowl ³ (PPI)		See label	\$5.00-25.00	N	N	N	P	F-G	N	E	N	N	N-P	F-G
Pursuit ²		2 fl oz	\$7.80	F-G	G-E	N	N	P	P-E	E	-	N	G	N
Sharpen ¹⁴		1 fl oz	\$6.50	P-F	G-E	P-F	P	F	P	F-P	P	P	P	P-F
Sonalan ³ (PPI)		See label	\$5.00-25.00	N	N	N	P	F-G	N	E	N	N	N-P	F-G
Sonic ^{2,14}		4-8 oz	\$22.00-44.00	P	E	-	F-E	G-E	E	E	-	F-E	G-E	G-E
Spartan ¹⁴		4.5-9 fl oz	\$20.00-40.00	P	P	F	F-E	G-E	F-E	F-E	P	N	G-E	F-E
Surveil ^{2,14}		2.1-4.2 oz WDG	\$15.00-29.00	P	E	-	P-G	G-E	E	E	-	F-E	G-E	F-E
Treflan ³ (PPI)		See label	\$5.00-25.00	N	N	N	P	F-G	N	E	N	N	N-P	F-G
Valor EZ/SX ¹⁴		2-3 oz SC/WDG	\$8.00-12.00	P-F	F-E	F-G	P-G	F-E	G-E	G-E	F-E	P	F	G
Verdict ^{14,15}		5 fl oz	\$9.00	P-F	G-E	P-F	P	F-G	F	G	G-E	P-F	F	F-G
Zidua ¹⁵		2-3.5 oz	\$18.00-40.00	F-E	P-F	-	F-E	F-E	F-E	G-E	-	P	F-E	G-E
Zidua Pro ^{2,14,15}		4.5 oz	\$15.00	F-E	P-F	-	F-E	F-E	F-E	G-E	-	P	F-E	G-E

^aMay carry over more than one cropping season. Follow labeled crop rotation restrictions - see Y15.

^bSee page 111 for control of volunteer canola and corn, and herbicide rates.

^cE = Excellent (90-99%), G = Good (80-90%), F = Fair (65-80%), P = Poor (40-65%), N = None.

^dIncludes resistant populations.

*Metribuzin at 0.33 lb/A DF, **Metribuzin at 0.5 lb/A DF.

Roundup Ready Soybean - Herbicides to apply in tank-mix or sequentially with glyphosate for control of weeds not controlled by glyphosate.

Refer to pages 25 through 28 for additional herbicides and information.

Herbicide ^{Site of action-pg 98-99}	Rate/A	Cost/A	Buckwheat, Wild	Canola, Vol. RR ^b	Horseweed (Marestail)	Kochia	Lambsquarters	Nightshade species	Pigweed, Redfoot	Prickly lettuce	Ragweed, Common	Smartweed, Annual	Waterhemp
PRE fb POST Weed Management Programs - add AMS at 1.5 lb/A and see label for adjuvant requirements.			Weed Control Ratings ^{c,d} - without glyphosate										
RP = Residual PRE listed on page 30, such as, Boundary, Fierce, Sharpen, Spartan, or Zidua, or combinations above.													
RP fb RU ⁹ (4.5 lb ae)+ AMS + HSOC	32-105 fl oz	\$7.00-25.00	PE	P-E	P-E	P-E	E	P-E	E	P-E	P-E	P-E	P-E
RP fb RU ⁹ + FlexstarGT ^{9,14} + HSMOC	32floz+2.68pt+1pt	\$45.00	G-E	E	P-G	G-E	E	E	E	G	E	E	P-E
RP fb RU ⁹ + Marvel ^{14,14} + NIS fb	32 fl oz + 7.25 fl oz	\$34.00 fb	G-E	E	P-G	F-E	E	E	E	G	E	E	P-E
RU ⁹ + Cobra ¹⁴ + NIS	fb 32floz+8-12 floz	\$20.00-28.00											
RP fb RU fb Storm + NIS fb RU if need	32 fl oz fb 1.5 pt	\$42.00 fb 7	G	F-G	P-E	F-E	G-E	G-E	E	G-E	F-E	E	F-E

POST herbicides^a - add AMS at 1.5 lb/A - see label for adjuvant requirements.

			Weed Control Ratings ^{c,d} - without glyphosate										
Basagran ⁶ + MSO	1.5-2 pt + 1.5 pt	\$12.00-17.00	P-G	P-G	N	P-E	F-E	N-G	F-E	G	P-F	E	F-E
Cadet ¹⁴ + NIS	0.65-0.9 fl oz	\$8.00-11.00	N-P	-	N	P-F	F-G	-	F-G	-	N	-	P-G
Cobra ¹⁴ + PO	8-12.5 fl oz	\$16.00-24.00	P	P	N	P-F	N	G	G-E	-	P-E	P	P-G
Extreme ^{2,9} + HSMOC	1.5-2.25 pt	\$5.00-8.00	G	P-E	P-G	P-E	G	E	E	G-E	P-E	G-E	P-E
FirstRate ² + PO	0.3-0.6 oz WDG	\$14.00-27.00	P-F	P-G	G-E	P	P	N	N-P	-	N	E	N
Flexstar ¹⁴ + MSO	0.75 pt + 1-1.5 pt	\$10.00	P	E	N-P	G-E	P-F	F-E	E	-	P-E	G-E	P-E
Flexstar GT ^{9,14} + HSMOC	2.68 pt + 1 pt	\$15.00	P-G	E	P-G	G-E	G-E	G-E	E	F-G	F-E	E	P-E
Glyphosate ⁹ (4.5 lb ae) + AMS	32 fb 32 fl oz	\$8.00 fb 8.00	G	N	P-E	P-E	E	E	E	E	P-E	E	P-E
Harmony DG/SG ² + NIS + AMS	1/12 oz / 1/8 oz	\$2.50/\$4.00	N	P	N	N	F-G	N	G	P	N	F-G	N
Marvel ¹⁴ + NIS	5 to 7 fl oz	\$9.00-13.00	P	E	N-P	G-E	F-G	F-E	E	-	P-E	G-E	P-E
Pursuit ² + MSO	2-3 fl oz + 1.5 pt	\$8.00-12.00	P	P-E	N	N	P	P-E	E	P-E	N	G	N
Raptor ² + MSO	4-5 fl oz + 1.5 pt	\$22.00-28.00	P	P-E	N	N	P-F	E	E	G	N	G-E	N
Resource ¹⁴ + NIS or MSO	3 fl oz	\$6.00	-	-	N	-	F-G	-	F-G	-	N-P	-	N-P
Storm ^{6,14} + NIS or MSO	1.5 pt	\$20.00	P-F	P-E	N	P-E	F-E	F-G	E	G	P-F	E	F-E
Ultra Blazer ¹⁴ + NIS or MSO	1.5-2 pt	\$17.00-23.00	P	F-G	N	P-G	N	F-G	E	-	N-F	E	P-E
Varisto ^{2,6} + MSO	16-27 fl oz + 1.5 pt	\$25.00-40.00	P-G	P-E	N	P-E	F-E	E	E	G	P-F	E	F-E

Herbicides for Liberty Link soybean ONLY

			Weed Control Ratings ^{c,d} - without glyphosate										
Liberty 280 ¹⁰ + AMS	36 fl oz	\$26.00	G	P-E	G-E	F-E	F-E	F-E	F-E	F-E	F-E	F-E	F-E
fb Liberty ¹⁰ + AMS	fb 29 fl oz	\$26 fb 21.00	G-E	F-E	E	E	E	E	E	G-E	E	E	G-E
+ Flexstar ¹⁴ + adjuvant	+ 0.75 pt	\$38.00	G	E	G-E	E	G-E	E	E	F-E	E	E	G-E
Residual PRE fb Liberty ¹⁰ + AMS	X rate fb 36 fl oz	\$25 fb 26.00	E	E	E	E	E	E	E	E	E	E	E

^aMay carry over more than one cropping season. Follow labeled crop rotation restrictions - see Y15.

^bSee page 111 for control of volunteer canola and corn, and herbicide rates.

^cE = Excellent (90-99%), G = Good (80-90%), F = Fair (65-80%), P = Poor (40-65%), N = None.

^dIncludes resistant populations.


*Metribuzin at 0.33 lb/A DF, **Metribuzin at 0.5 lb/A DF.

DRY EDIBLE BEAN

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 and some POST-Applied Herbicides

Eptam (EPTC ⁸)	3.5 to 4.5 pt EC 15 to 20 lb G (3 to 4 lb)	Grass and some broadleaf weeds.	PPI.	PPI immediately after application. Apply with other soil-applied herbicides for greater weed control. A1-2 B1 F1-2 S3
Prowl Prowl H2O (pendimethalin ³)	2.4 to 3.6 pt 3.3EC 2.1 to 3 pt 3.8ACS (1 to 1.5 lb)	Poor wild oat and no wild mustard control.	PPI. Fall or Spring.	PPI within 24 hours after application. Apply fall applications when soil temperature is less than 45 F to reduce fall herbicide degradation. Adjust rate for soil type. Use EC formulation in spring and 10G formulation in fall for more consistent herbicide activation in soil. Refer to label for tank-mixtures. A1-2 B1-2 B7 E11 S3 Y1 Y13 Y15
Treflan / generic trifluralin ³	1 to 2 pt EC 5 to 10 lb 10G (0.5 to 1 lb)			
Sonalan (ethalfluralin ³)	1.5 to 4.5 pt EC (0.55 to 1.69 lb) 5.5 to 11.5 lb 10G (0.55 to 1.15 lb)			
Dual/II/Magnum (S/metolachlor ¹⁵)	1 to 2 pt EC (0.95 to 1.9 lb)	Grass and some broadleaf weeds.	Shallow PPI or PRE.	Shallow PPI improves consistency of weed control. PRE requires precipitation for herbicide activation. Adjust rate for soil type and OM. Allow a 70 day PHI. A1-2 B1 F3 S3
Outlook / generic dimethenamid ¹⁵	16 to 21 fl oz EC (0.75 to 1 lb)			
Spartan Elite (s-metolachlor ¹⁵ & sulfentrazone ¹⁴)	20 to 26 fl oz EC (0.98 to 1.28 lb & 1.75 to 2.25 oz)			
Spartan Charge (carfentrazone ¹⁴ & sulfentrazone ¹⁴)	3.75 to 5.75 floz SE (0.16 to 0.25 oz & 1.48 to 2.26 oz)	Small-seeded broadleaf weeds.	Shallow PPI or PRE.	ND Section 24c label indemnification agreement required - user assumes all risk of crop injury. Do not use on coarse texture soils or soil with <1.5% OM. Adjust rate for soil type and soil pH. Rainfall required for activation. A1-2 E12 F1 S6-12 Y14-15
Permit (halosulfuron ²) 	0.5 to 0.67 oz DF (0.38 to 0.5 oz)	Many broadleaf weeds and yellow nutsedge.	Shallow PPI, PRE, or POST up to dry bean flowering.	PRE requires precipitation for herbicide activation. POST: Apply with NIS at 1 to 2 qt/100 gal water. Permit: PRE controls additional weeds than POST, including pigweed and lambsquarters. Refer to label when tank-mixing with other herbicides. Will not control ALS resistant weeds. A3 A5-8 E8 F1 S8-10 Y2 Y3 Y15
Pursuit (imazethapyr ²)	2 fl oz SL (0.5 oz)	Small broadleaf weeds.		

POST-Applied Herbicides

Basagran 5L / generic bentazon ⁶ + MSO adjuvant	0.4 to 1.6 pt SL / 0.5 to 2 pt applied 1 to 4 times. (0.25 to 1 lb)	Small broadleaf weeds and suppression of Canada thistle.	POST. Dry bean: After emergence. Broadleaf weeds: Small.	Non-residual, contact herbicide requiring >15 gpa and full sunlight. Add oil adjuvant at 1 to 2 pt/A. Maximum bentazon amount per season is 2 lb/A. Refer to E3 for additional information. A3 E3 F1 F6 S6-12 T3
Raptor (imazamox ²)	4 fl oz SL (0.5 oz)	Annual grass and broadleaf weeds. No control of ALS-resistant weeds.	POST. Drybean: 1 st trifoliolate but prior to flowering.	Add oil additive at 1 to 2 pt/A plus 28% UAN at 2 qt/A (except during high humidity). A3 A5-8 E10 F1 S8-10 Y2 Y15
Varisto (bentazon ⁶ & imazamox ²)	16 to 21 fl oz SL (0.5 to 0.66 lb + 0.38 to 0.5 oz)	Small annual grass and broadleaf weeds and suppression of Canada thistle.	Weeds: Small. Allow a 30 day PHI.	Add oil adjuvant at 1 to 2 pt/A. Bentazon may be applied sequentially to improve weed control. Refer to E3 for additional information. A3 A5-8 E1 E3 S1-13 T3 Y15

DRY EDIBLE BEAN

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
Reflex (fomesafen ¹⁴)	0.75 pt EC (0.188 lb)	Small annual broadleaf weeds including ragweed, kochia, and nightshade.	Weeds: 1 to 3 inches tall. PHI: 45 days.	Contact herbicide requiring small weed size, >15 gpa, oil adjuvant at 1 to 2 pt/A, and full sunlight. Oil adjuvant will increase weed control and risk of crop injury. Refer to E4 for improved weed control. A3 E3 E5 F1 F5 S6-11 Y10 Y15
Assure II Targa (quizalofop ¹)	7 to 12 fl oz EC (0.77 to 1.32 oz)	Annual grasses and quackgrass.	POST. Dry bean: PHI: Assure II, Poast, Select/Max = 30 days. Fusilade DX = 60 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. 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 E1-2
Fusilade DX (fluazifop ¹)	5 to 12 fl oz EC 1.25 to 3 oz)			
Poast (sethoxydim ¹)	0.5 to 1.5 pt EC (0.1 to 0.3 lb)	Annual grasses.	Grass: Refer to soybean section on page 27.	
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.		

NDSU Dry Bean Tank-Mix

Basagran 5L / bentazon⁶ 4L + Raptor² + Reflex¹⁴ + Select/clethodim¹ + MSO adjuvant	0.4 to 0.56 pt SL / 0.5 to 0.67 pt SL + 1 fl oz SL + 2 to 4 fl oz EC + 2 fl oz EC + 1 to 1.5 pt/A	Grass and broadleaf weeds, including kochia, pigweed, and nightshade. May not control wild buckwheat or ragweed >2 inches	POST. Weeds. Small. Must be less than 1 to 2 inches tall.	User assumes all risk of inadequate weed control when using this reduced-rate treatment. MSO adjuvant is required. Repeat application 7 to 10 days later with some or all herbicides in the tank-mix to kill uncontrolled weeds and control successive weed flushes. Reduced herbicide rates cause resistant weeds - scout weed control often and hand-pull any escaped weeds or small patches of weeds that could be resistant. Refer to E3-4 for additional information. A3 A5-8 E3 E5 E10 F1 F4-6 S1-13 Y2-3 Y10
Varisto SL Basagran 5L Basagran 4L Raptor	5.25 fl oz contains 4.2 fl oz or 5.25 fl oz + 1 fl oz			

Dry Bean Preharvest / Desiccation Herbicides


Glyphosate ⁹	Up to 0.75 lb ae	Harvest aid/ Weed control.	Prior to harvest. Pods = yellow and leather texture. Seed = hard dough stage with <30% moisture. PHI = 7 days.	Do not apply to dry bean grown for seed because reduced germination/vigor may occur. Use only labeled formulations. Add AMS at 8.5 lb/100 gal. Non-selective, non-residual, translocated, foliar herbicide. A3-7 B1 B8
Defol 750 + oil adjuvant (sodium chlorate)	3.2 qt SL + 1 qt/A	Dry bean and weed desiccant.	Prior to harvest. >80% pods yellow/brown. >70% leaves lost green color. PHI: Defol = 0 days paraquat = 7 days. Sharpen = 2 days. Valor = 5 days.	Contact herbicides require >15 gpa and full sunlight. Apply at >10 gpa for ground and >5 gpa for aerial application. Apply Sharpen and Valor with AMS at 8.5 to 17 lb/100 gal water or UAN at 2.5 gal/100 gal water and with glyphosate or paraquat for weed desiccation. Do not apply Sharpen to dry bean grown for seed because reduced germination/vigor may occur. Do not feed or graze treated plants. B11-12 E13
Paraquat ²² + NIS RUP	1.2 to 2 pt 2SL 0.8 to 1.3 pt 3SL (0.3 to 0.5 lb)			
Sharpen + MSO adjuvant (saflufenacil ¹⁴)	1 to 2 fl oz SC + 1 to 1.5 pt/A (0.36 to 0.72 oz)			
Valor SX Valor EZ + MSO adjuvant (flumioxazin ¹⁴)	2 to 3 oz WDG 2 to 3 fl oz SC + 2 pt/A (1 to 1.53 oz)			

FIELD PEA

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

Far-Go (triallate ⁸) 	1.25 qt EC (1.25 lb)	Wild oat.	PPI.	PPI immediately after application. Two pass incorporation improves weed control. A1-2 B1 C8 G1
Prowl Prowl H2O (pendimethalin ³)	1.75 to 3.6 pt EC 1.5 to 3 pt ACS (0.72 to 1.5 lb)	Grass and some broadleaf weeds.	PPI. Fall or Spring.	Fall apply when soil temperature is less than 45 F to reduce fall herbicide degradation. Adjust rate for soil type. Some pea varieties may be injured. A1-2 B1 B7 E11 G1 S3 Y13 Y15
Treflan / generic trifluralin ³	1 to 1.5 pt EC 5 to 7.5 lb 10G (0.5 to 0.75 lb)	Poor wild oat and no wild mustard control.		
Sonalan (ethalfluralin ³)	1.5 to 2 pt EC 5.5 to 7.5 lb 10G (0.55 to 0.75 lb)			
Dual/II/Magnum (S/metolachlor ¹⁵)	1 to 2 pt EC (0.95 to 1.9 lb)		Shallow PPI or PRE.	Shallow PPI improves consistency of weed control. PRE requires precipitation for herbicide activation. Adjust rates for soil type and OM. Refer to label for rate structure. A1-2 B1 B4 E12 F3 G1 S6-11 Y15
BroadAxe XC Spartan Elite (metolachlor ¹⁵ & sulfentrazone ¹⁴)	20 to 32 fl oz EC (0.98 to 1.58 lb & 1.75 to 2.8 oz)	Annual grass and small-seeded broadleaf weeds.		
Spartan Charge (carfentrazone ¹⁴ & sulfentrazone ¹⁴)	3.75 to 7.75 floz SE (0.16 to 0.34 oz & 1.48 to 3.05 oz)	Small-seeded broadleaf weeds.		
Pursuit (imazethapyr ²)	2 fl oz SL (0.5 oz)	Small broadleaf weeds. No control of ALS- resistant weeds.		Shallow PPI improves consistency of weed control. PRE requires precipitation for herbicide activation. A1-2 E8 G1 S6 X1 Y2 Y15
Sharpen (saflufenacil ¹⁴)	1 to 2 fl oz SC (0.36 to 0.72 oz)	Small broadleaf weeds including kochia, pigweed, lambsquarters, nightshade and winter annuals.	EPP, shallow PPI, or PRE.	PRE requires precipitation for herbicide activation. Provides burndown control of small emerged broadleaf weeds including winter-annual species. Refer to label for tank-mix options. A1-2 B1-2 B12 S1-12
Metribuzin ⁵	0.25 to 0.5 lb DF 0.38 to 0.75 pt 4F (0.19 to 0.38 lb) 0.167 to 0.33 lb DF 0.25 to 0.5 pt 4F (0.125 to 0.25 lb)	Suppression of lambsquarters, henbit, mustard, and chickweed.	Preplant or PRE. POST. Weeds: Small.	Contact herbicide requiring small weed size, >20 gpa, and full sunlight. Use only registered formulations. Adjust rate for soil type. Refer to label for application and environment information, and special precautions that may affect weed control and crop safety. Allow a 50 day PHI. A1-2 E7 G1 S7 Y4 Y12 Y15

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
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POST-Applied Herbicides

Basagran 5L / generic bentazon⁶ + MSO adjuvant	0.4 to 1.6 pt SL / 0.5 to 2 pt applied 1 to 4 times. (0.25 to 1 lb)	Small broadleaf weeds and suppression of Canada thistle.	POST. Dry pea: At least 3 pair of leaves or 4 nodes. Broadleaf weeds: Small.	Non-residual, contact herbicide requiring >15 gpa and full sunlight. Add oil adjuvant at 1 to 2 pt/A. Maximum bentazon amount per season is 2 lb/A. Refer to E3 for additional information. A3 E3 G1-2
Pursuit (imazethapyr²)	2 fl oz SL (0.5 oz)	Small annual broadleaf weeds. No control of ALS-resistant weeds.	POST. Pea: At least 3 inches tall but prior to 5 nodes and prior to flowering.	User assumes all risk of crop injury. Add NIS at 1 pt/100 gal or oil adjuvant at 1 to 2 pt/A. Oil adjuvant increases weed control and risk of crop injury. Do not apply during adverse weather conditions. Risk of Raptor carryover is less than Pursuit. Bentazon may be applied sequentially to improve weed control. Refer to E3 for additional information. Bentazon antagonizes Raptor and reduces risk of injury to field pea. A3 A5-8 E3 E8 E10 F4 G1 S6 Y2 Y15
Raptor + Basagran 5L / generic bentazon⁶ (imazamox²)	4 fl oz SL + 0.4 to 0.8 pt/A SL / 0.5 to 1 pt/A SL (0.5 oz + 0.25 to 0.5 lb)	Small annual grass and broadleaf weeds and suppression of Canada thistle.	Weeds: Small. Allow a 60 day PHI.	
Varisto (bentazon⁶ & imazamox²)	16 to 21 fl oz SL (0.5 to 0.66 lb + 0.38 to 0.5 oz)			
Thistrol (MCPB⁴)	2 to 6 pt SL (0.5 to 1.5 lb ae)	Small broadleaf weeds.	POST. Pea: 3 nodes until prior to flowering.	Slight, temporary injury may occur. Do not apply when temperature exceeds 90 F or when peas are stressed. Suppresses Canada thistle. G1 G3
Assure II Targa (quizalofop¹)	7 to 12 fl oz EC (0.77 to 1.32 oz)	Annual grasses and quackgrass.	POST. Pea: Refer to PHI. PHI: Assure = 60 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. Refer to Remarks in the POST grass herbicide section under Soybean for methods to avoid antagonism and reduced grass control from broadleaf herbicides. Clethodim may injure pea when applied during bloom.
Poast (sethoxydim¹)	0.5 to 1.5 pt EC (0.1 to 0.3 lb)	Annual grasses.	Clethodim = 21 days and prior to bloom. Poast = 30 days.	Refer to Remarks in the POST grass herbicide section under Soybean for methods to avoid antagonism and reduced grass control from broadleaf herbicides. Clethodim may injure pea when applied during bloom. A3 A5-6 E2
Select Max 1EC Select 2EC Shadow 3EC (clethodim¹)	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: Refer to soybean section on page 27.	

Preharvest Herbicides


Glyphosate⁹	Up to 2.25 lb ae.	Emerged grass and broadleaf weeds.	Prior to harvest. Pea: >80% yellow/brown pods and <30% seed moisture.	Use only registered formulations. Add AMS at 8.5 lb/100 gal. Do not apply to field pea grown for seed because reduced germination/vigor may occur. A4-6 B8 D8
Paraquat²² + NIS	1.5 to 2 pt 2SL 1 to 1.3 pt 3SL (0.37 to 0.5 lb)	Desiccant.	PHI: Glyphosate = 7 days. paraquat = 7 days. Sharpen = 3 days Valor = 5 days.	Contact herbicides require >15 gpa and full sunlight. Apply at >10 gpa for ground and >5 gpa for aerial application. Apply Sharpen and Valor with AMS at 8.5 to 17 lb/100 gal water or UAN at 2.5 gal/100 gal water and with glyphosate or paraquat for weed desiccation. Treated plants maybe grazed and hayed.
Sharpen + MSO adjuvant (saflufenacil¹⁴)	1 to 2 fl oz SC + 1 to 1.5 pt/A (0.36 to 0.72 oz)			Do not apply Sharpen to field pea grown for seed because reduced germination/vigor may occur. A4-8 B8 B11-12
Valor SX Valor EZ + (flumioxazin¹⁴) + MSO adjuvant	2 to 3 oz WDG 2 to fl oz SC + 2 pt (1.02 to 1.53 oz)			

CHICKPEA/GARBANZO BEAN AND LENTIL

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

Far-Go (triallate ⁸) 	1.25 qt EC (1.25 lb)	Wild oat.	PPI.	PPI immediately after application. A two pass incorporation improves weed control. A1-2 B1 C8 H1-2
Prowl Prowl H2O (pendimethalin ³)	1.75 to 3.6pt 3.3EC 1.5 to 3 pt 3.8ASC (0.72 to 1.5 lb)	Grass and some broadleaf weeds.	PPI. Fall or Spring.	Adjust rate for soil type. Apply in fall when soil temperature is less than 45 F to reduce fall herbicide degradation. A1-2 B1 B7 E11 H1-2 Y1 Y13 15
Treflan / generic trifluralin ³	1 to 1.5 pt EC (0.5 to 0.75 lb)	Poor wild oat and no wild mustard control.	PPI. Fall or Spring. See Remarks for use in Lentil.	Lentil: Tolerance is marginal and injury may occur under stress conditions. Refer to label for additional information. A1-2 B1 B7 E11 H1-3 Y1 Y13 Y15
Sonalan (ethalfluralin ³)	1.5 to 2 pt EC 5.5 to 7.5 lb 10G (0.55 to 0.75 lb)			Lentil: Fall-apply Sonalan 10G just prior to snow cover into stubble on fields that have been direct-seeded with 30% or less soil disturbance for 2 to 3 years. Incorporate once using minimum soil disturbance with a rotary hoe or heavy harrow. Refer to label. A1-2 B1 B7 E11 H1-3 Y1 Y13 Y15
Dual/II/Magnum (S/metolachlor ¹⁵)	1 to 2 pt EC (0.95 to 1.9 lb)		Shallow PPI or PRE.	Shallow PPI improves consistency of weed control. PRE requires precipitation to activate herbicide. Adjust rate for soil type and OM. Refer to label for tank-mix options. Do not apply Spartan Charge or BroadAxe to lentil. A1-2 B1 B4 E12 H1-2 Y14 Y15
Outlook / generic dimethenamid ¹⁵	16 to 21 fl oz EC (0.75 to 1 lb)			
BroadAxe XC Spartan Elite (s-metolachlor ¹⁵ & sulfentrazone ¹⁴) Chickpea Only	20 to 32 fl oz EC (0.98 to 1.58 lb & 1.75 to 2.8 oz)	Annual grass and small-seeded broadleaf weeds.		
Spartan Charge (carfentrazone ¹⁴ & sulfentrazone ¹⁴) Chickpea Only	3.75 to 7.75 floz SE (0.16 to 0.34 oz & 1.48 to 3.05 oz)	Small-seeded broadleaf weeds.		
Pursuit (imazethapyr ²)	2 fl oz SL (0.5 oz)	Small broadleaf weeds. No control of ALS-resistant weeds.		E10 H1-2 Y2 Y15
Sharpen (saflufenacil ¹⁴)	Chickpea = 1 to 2 fl oz SC (0.36 to 0.72 oz) Lentil = 0.75 fl oz (0.27 oz)	Small broadleaf weeds including winter-annual species.	Fall, EPP, shallow PPI, and PRE.	PRE requires precipitation to activate herbicide. Provides burndown control of small emerged broadleaf weeds. Refer to label for tank-mix options. A1-2 B1-2 B12 S1-12
Metribuzin ⁵ Lentil Only	0.33 to 0.5 lb DF 0.5 to 0.75 pt 4F (0.25 to 0.38 lb) 0.167 to 0.33 lb DF 0.25 to 0.5 pt 4F (0.125 to 0.25 lb)	Suppression of lambsquarters, henbit, chickweed and mustard.	PRE. POST. Weeds: Small.	Adjust rates for soil type. Refer to label for application and environment information and special precautions that may affect weed control and crop safety. Allow a 75 day PHI. A1-2 E7 H1-2 Y4 Y11 Y15

CHICKPEA/GARBANZO BEAN AND LENTIL

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
POST-Applied Grass Herbicides				
Assure II Targa (quizalofop ¹)	7 to 12 fl oz EC (0.77 to 1.32 oz)	Annual grasses and quackgrass.	POST. Crop: Refer to PHI. PHI: Assure = 60 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. Refer to Remarks in the POST grass herbicide section under Soybean for methods to avoid antagonism and reduced grass control from broadleaf herbicides. A5-6 E2
Poast (sethoxydim ¹)	0.5 to 1.5 pt EC (0.1 to 0.3 lb)	Annual grasses.	Poast = 50 days. Clethodim = 30 days.	
Select Max 1EC Select 2EC Shadow 3EC (clethodim ¹)	9 to 16 fl oz EC 4 to 8 fl oz EC 2.7 to 5.3 fl oz EC (1 to 2 oz)	Annual grasses and quackgrass.	Grass: Refer to soybean section on page 27.	

Preharvest Herbicides

Glyphosate ⁹	Up to 2.25 lb ae	Emerged grass and broadleaf weeds.	Harvest aid and desiccant. PHI: 7 days	Use only registered formulations. Apply with AMS at 8.5 lb/100 gal. Do not apply to crop grown for seed because reduced germination/vigor may occur.
		Perennial weeds.	Spot treatment. PHI: 14 days.	For spot treatment use a 2% solution for perennial broadleaf weeds at or beyond the bud stage. Crop will be killed in treated areas. A4-6 B8
Paraquat ²² + NIS	1.5 to 2 pt 2SL 1 to 1.3 pt 3SL (0.37 to 0.5 lb)	Chickpea and weed desiccant.	Prior to harvest. >80% yellow/brown pods and <40% green chickpea leaves or <30% green lentil leaves.	Contact herbicides require >15 gpa and full sunlight. Apply at >10 gpa for ground and >5 gpa for aerial application. Apply Sharpen with AMS at 8.5 to 17 lb/100 gal water or UAN at 2.5 gal/100 gal water and with glyphosate or paraquat for weed desiccation. Do not graze or hay treated plants. Do not apply Sharpen to crop grown for seed because reduced germination/vigor may occur. B11-12 E13
Sharpen + MSO adjuvant (saflufenacil ¹⁴)	1 to 2 fl oz SC + 1 to 1.5 pt/A (0.36 to 0.72 oz)			
Valor SX Valor EZ + (flumioxazin ¹⁴) + MSO adjuvant	2 to 3 oz WDG 2 to 3 fl oz SC 2 pt (1.02 to 1.53 oz)	Valor = chickpea only.	PHI: paraquat = 7 days. Sharpen = 2 days Valor = 5 days.	

Clearfield Lentil

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
Beyond (imazamox ²)	4 to 6 fl oz SL (0.5 to 0.75 oz)	Annual grass and broadleaf weeds including wild oat, foxtail, Japanese and downy brome and Persian dandel.	POST. Lentil: 2 to 6 leaf stage. Weeds: Small and actively growing.	Apply only to Clearfield lentil varieties. Add NIS at 1 qt/100 gal water or oil adjuvant at 1 to 2 pt/A + 28% UAN at 2.5 gal/100 gal water. MSO adjuvants enhance weed control more than PO or NIS. Refer to label for weed size and application information. A5-8 E10 Y15