SUNFLOWER

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

Refer to page 6 for Fall or Spring Early Preplant Herbicides.

Refer to page 37 for additional herbicides to use in conventional or herbicide resistant sunflower.

Soil-Applied Herbicides

Eptam (EPTC)	2.5 to 3.5 pt (2 to 3 lb)	Grass and some broadleaf weeds.	PPI.	No wild mustard control. PPI immediately after application. A1-2 B1 F1-2 J1
Prowl H20 (pendimethalin)	2.4 to 3.6 pt 3.3EC 2.1 to 3 pt 3.8ACS (1 to 1.5 lb)		PPI.	Poor wild oat and no wild mustard control. Adjust rate for soil type. Refer to label for tank-mix options.
	3 to 3.6 pt 3.3EC 2.7 to 3 pt 3.8ACS (1.25 to 1.5 lb)		PRE - 30 days before to 1 day after seeding.	A1-2 B1 B6 E10 J1 X1 Y1 Y14 Pages: 104-105, 108-110 Apply PRE for no-till sunflower only.
Treflan / generic trifluralin	1 to 2 pt EC 5 to 10 lb 10G (0.5 to 1 lb)		PPI.	PPI within 24 hours after application. Poor wild oat and no wild mustard control. Adjust rate for soil type.
Sonalan (ethalfluralin)	1.5 to 3 pt EC 5.5 to 11.5 lb 10G (0.55 to 1.15 lb)		PPI. Spring. Fall: From October	Use highest rate allowed for nightshade control. A1-2 B1 B6 E10 J1 X1 Y1 Y14 Pages: 102-103, 104-105, 108-110
	7.5 to 11.5 lb 10G (0.75 to 1.15 lb)	Foxtail.	1 to December 31.	For use in reduced or conservation tillage. Incorporate twice at 2 to 3 inches deep using a V-blade undercutter or rotary hoe. For fall applications, incorporate once in the fall and once in the spring before seeding. A1-2 B1 B6 E10 J1 X1 Y1 Y14 Pages: 108-110
Dual Magnum (S-metolachlor)	1 to 2 pt (0.95 to 1.9 lb)	Grass and some broadleaf weeds.	PPI or PRE.	No wild oat or wild mustard control. PPI improves consistency of control. Requires moisture for activation. A1-2 B1 E5 J1
Spartan (sulfentrazone)	3 to 8 fl oz F (1.5 to 4 oz)	Small-seeded broadleaf weeds including kochia, pigweed, lambsquarters, nightshade, and biennial wormwood.	EPP, shallow PPI, PRE or Fall.	Requires precipitation for activation. EPP applications up to 30 days prior to planting improves likelihood of activation by moisture. Adjust rate for soil type. Temporary sunflower injury may occur in coarse, low organic matter soils with pH greater than 7.8. May give 6 to 8 weeks residual weed control. Commercial mixture with Aim available as Spartan Charge. A1-2 B1 E11 J1 J3 S1 S4-5 S7 Y14 Pages: 108-110

POST-Applied Herbicides

Assert (imazamethabenz)	0.6 to 0.8 pt (0.19 to 0.25 lb)	Wild mustard.	POST. Sunflower: Less than 8 leaves or 15 inches tall. Mustard species including canola: Prior to bloom.	Add NIS at 0.25% v/v. Sunflower injury may occur when applied at high temperature and humidity. A5 J1-2 S1 X1 Y2 Pages: 102-103, 108-110
Assure II / Targa (quizalofop)	7 to 10 fl oz (0.77 to 1.1 oz)	Annual grasses and quackgrass.	Grass: Refer to soybean section on page 26.	Add oil adjuvant at 1% v/v but not less than 1.25 pt/A Oil adjuvant at more than 1 qt/A is not needed.
Poast (sethoxydim)	0.5 to 1.5 pt (0.1 to 0.3 lb)	Annual grasses.		See Select Max label for detailed adjuvant recommendations. Refer to soybean section or label for tank-mix options,
Select / generic clethodim	4 to 8 fl oz (1 to 2 oz)	Annual grasses and quackgrass.		possible grass antagonism with broadleaf herbicides, and methods to avoid reduced grass control. Allow a 70 day PHI.
Select Max (clethodim)	9 to 16 fl oz (1.125 to 2 oz)			A3 A5-6 E2 J1 S2 S6 X1 Pages: 102-103, 104-105

Pages 102-103 = Herbicide resistance, Pages 104-105 = Generic and commercial names, Pages 108-110 = Crop rotation restrictions.

Preharvest Herbicides

Roundup / generic glyphosate	Up to 0.75 lb ae See Remarks.	Preharvest weed control.	Backside of sunflower heads yellow and bracts turning brown at the shoulder. Seed moisture content under	Do not apply to sunflower grown for seed because reduced germination / vigor may occur. Use only registered formulations. Refer to label for adjuvant use. Add AMS fertilizer at 4 lb/100 gal, or more for hard water. Allow 7 days between application and harvest or livestock feeding. A3-7 B2 X1. Pages: 102-103, 104-105.
paraquat RUP	1.5 to 2 pt 2SL 1 to 1.35 pt 3SL (0.375 to 0.5 lb)	Desiccant.	35%.	Use allowed on confectionery and oilseed varieties. Add NIS at 0.25% v/v. Most active in hot and sunny conditions. Randomly sample 10 average heads for seed moisture. Allow a 7 day PHI. B8. Pages: 104-105.
Sharpen (saflufenacil)	1 to 2 fl oz (0.36 to 0.71 oz)			Do not apply to sunflower grown for seed because reduced germination / vigor may occur. Add MSO adjuvant at 1% but no less than 1.25 pt/A and AMS at 8.5 to 17 lb/100 gal of water. Use 5 gpa for aerial application. May be tank-mixed with glyphosate. Allow a 7 day PHI.

HERBICIDE RESISTANT SUNFLOWER

Refer to page 36 for additional herbicides to use in conventional or herbicide resistant sunflower.

Clearfield Sunflower

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
Beyond (imazamox)	4 fl oz (0.5 oz ae)	Annual broadleaf weeds including wild mustard and black nightshade. No ALS-resistant kochia control.	Less than 3 inches tall. Grass weeds: Less	Apply only to Clearfield sunflower varieties. Add NIS at 0.25% v/v + UAN at 2.5% v/v. MSO and oil adjuvants are not prohibited but may increase activity and cause temporary crop injury. Refer to label for weeds controlled, adjuvant use, and tank-mix options. A3 A5-7 E9 J4 S3 S4 X1 Y1-2 Y17 Pages: 102-103, 108-110

Express Sun Sunflower

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
Express SG (tribenuron)	0.25 to 0.5 oz SG (0.125 to 0.25 oz)	Annual broadleaf weeds including wild mustard. Control or suppression of Canada thistle. No grass or ALS-resistant kochia control.	stage but prior to bud formation. Broadleaf weeds:	Apply only to Express Sun sunflower varieties. MSO-type oil adjuvants at 1.25 pt/A enhanced weed control more than NIS or petroleum oil adjuvants. Apply with a registered POST grass herbicide. Sequential applications are allowed but observe a 14 day interval between applications and do not exceed 1 oz/A. Allow a 70 day PHI. A3 A5-7 J1 J5 S3 T2 X1 Y1-2 Pages: 102-103, 104-105

Pages 102-103 = Herbicides resistance, Pages 104-105 = Generic and commercial names, Pages 108-110 = Crop rotation restrictions.

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
Refer to page 6 f	or Fall or Spring E	arly Preplant Her	bicides.	
Soil-Applied Herl	bicides			
Eptam (EPTC)	3.5 pt EC 15 lb 20G (3 lb)	Grass and some broadleaf weeds.	PPI.	Refer to narrative A1 for application information. Poor wild mustard control. A1-2 B1 S4
Treflan / generic trifluralin	1 to 2 pt EC 5 to 10 lb 10G (0.5 to 1 lb)		PPI. Fall or spring.	Poor wild oat and no wild mustard control. Adjust rate for soil type. Use highest rate allowed for nightshade control.
Sonalan (ethalfluralin)	1.5 to 3 pt EC 5.5 to 11.5 lb 10G (0.55 to 1.15 lb)		PPI. Fall or Spring.	A1-2 B1 B6 E10 S7 X1 Y1 Y14 Pages: 104-105, 108-110
Dual / generic S/metolachlor	1 to 2 pt (0.95 to 1.9 lb)		PPI or PRE.	S-metolachlor may give greater weed control than generic metolachlor at equal product rates. Poor wild oat and wild mustard control. Shallow PPI gives more consistent weed control. A1-2 B1 E5 S4 Pages: 104-105
POST-Applied He	erbicides			
Harmony SG (thifensulfuron)	0.45 to 0.6 oz SG (0.225 to 0.3 oz)	Annual broadleaf weeds.	POST: Allow an 81 day PHI. Weeds: Small.	Add NIS at 0.25 to 0.5% v/v or an oil adjuvant at 1.25 pt/A + UAN at 2 to 4 qt/A or or AMS at 2 lb/A. Sequential applications are allowed but do not exceed 0.6 oz/A. A3 A5 S1 S3 S5 X1 Y1 Y3 Pages: 102-103
Poast (sethoxydim)	0.5 to 1.5 pt (0.1 to 0.3 lb)	Annual grasses.	POST. Safflower: Refer to PHI.	Add oil adjuvant at 1% v/v but not less than 1.25 p Oil adjuvant at more than 1 qt/A is not needed. See Select Max label for detailed adjuvant
Select / generic clethodim	4 to 8 fl oz (1 to 2 oz)	Annual grasses and quackgrass.	Grass weeds: Refer to soybean section on page	recommendations. Refer to soybean section or label for tank-mix options, possible grass antagonism with broadleaf herbicides, and methods to avoid reduced grass control.
Select Max (clethodim)	9 to 16 fl oz (1.125 to 2 oz)		26.	Allow a 70 day PHI. A3 A5-6 E2 S2 S6 X1 Pages: 102-103, 104-105
Preharvest Herbi	cides			
Roundup / generic glyphosate	Up to 2.25 lb ae See Remarks.	Preharvest weed control.	When seed coat turns white, at least 20 days after end of flowering on secondary branches.	Do not apply to safflower grown for seed because reduced germination / vigor may occur. Use only registered formulations. Add AMS fertilizer at 4 lb/100 gal, or more for hard water. Refer to label for adjuvant use. Allow 7 days between application and harvest or livestock feeding. A3-7 B2 X1 Pages: 102-103, 104-105
	1	1	1.4	

After physiological maturity and 7 day PHI. Pages 102-103 = Herbicides resistance, Pages 104-105 = Generic and commercial names, Pages 108-110 = Crop rotation restrictions.

Desiccant.

Contact herbicide requiring thorough coverage. Apply aerially at 5 to 10 gpa or by ground at 20 to 30

gpa. Most active in hot and sunny conditions.

1 gal 6SL (6 lb)

Drexel Defol

(sodium chlorate)

				FL
- - - - - -	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
Refer to page 6	for Fall or Spring	g Early Preplant He	rbicides.	
rtoror to page o	Tor I am or opini	g Larry 1 Topiant 110	Diolado.	
Soil-Applied He	rbicides			
Treflan /	1 to 2 pt	Grass and some	PPI.	Adjust rate for soil texture.
generic trifluralin	5 to 10 lb 10G	broadleaf weeds.	Fall.	Deep incorporate within 24 hours after application.
-	1			

Treflan / generic trifluralin	1 to 2 pt 5 to 10 lb 10G (0.5 to 1 lb)	Grass and some broadleaf weeds.	PPI. Fall.	Adjust rate for soil texture. Deep incorporate within 24 hours after application. A1-2 B1 B6 E10 K1-2 S7 X1 Y14 Pages: 104-105, 108-110
Callisto (mesotrione)	3 to 6 fl oz (1.5 to 3 oz)	Most broadleaf weeds.	PRE.	For emerged weeds at application add oil adjuvant at 1.25 pt/A + UAN at 2.5% v/v or AMS at 8.5 lb/100 gallons water. POST application may injure or kill flax. A3 A5-6 D7 K1 X1 Y9 Pages: 108-110
Spartan (sulfentrazone) Section 18 or Section 3 (Fed.) Registration Pending	3 to 8 fl oz F (1.5 to 4 oz)	Small-seeded broadleaf weeds including kochia, pigweed, lambsquarters, nightshade, and biennial wormwood.	EPP, shallow PPI, PRE or Fall.	Requires precipitation for activation. EPP applications up to 30 days prior to planting improves likelihood of activation by moisture. Adjust rate for soil type. May give 6 to 8 weeks residual weed control. Refer to label for application information. A1-2 B1 E11 K1 S1 S3-5 S7 Y14 Pages: 108-110

POST-Applied Herbicides

Buctril / generic bromoxynil	1 pt (0.25 lb)	Small broadleaf POST. Flax: 2-tall.	Flax: 2- to 8-inches	Most active in hot and sunny conditions. Poor wild mustard control. Good buckwheat control. Flax injury is possible. K1
MCPA	0.5 pt 4EC/SL (0.25 lb ae)			Use MCPA ester on hard-to-kill weeds. Early application is less injurious to flax. K1
Bronate / generic bromoxynil & MCPA	0.9 pt 4EC 11.4 fl oz 5EC (0.23 & 0.23 lb ae)			Apply to small weeds prior to bud stage of flax. Risk of flax injury is greatest in hot and humid weather. K1 Pages: 102-103, 104-105
Curtail M / generic clopyralid & MCPA	1.33 to 1.75 pt (1.1 to 1.5 oz ae & 6.25 to 8.25 oz ae)	Broadleaf weeds including Canada thistle and perennial sowthistle.	POST. Flax: 2- to 6-inches tall. Canada thistle: 4- to 6-inches tall.	Apply after most thistle shoots have emerged. Allow a 72 day PHI. K1 C7 T2 Pages: 102-103, 104-105, 108-110
Assure II Targa (quizalofop)	8 to 10 fl oz (0.88 to 1.1 oz)	Annual grasses and quackgrass.	POST. Flax: Refer to PHI.	Add oil adjuvant at 1% v/v but not less than 1.25 pt/A. Oil adjuvant at more than 1 qt/A is not needed. See Select Max label for detailed adjuvant
Poast (sethoxydim)	0.5 to 1.5 pt (0.1 to 0.3 lb)	Annual grasses.	soybean section on page 26.	recommendations. May be tank-mixed with bromoxynil or MCPA ester for broad-spectrum weed control. Refer to soybean section or label for tank-mix options,
Select / generic clethodim	4 to 8 fl oz (1 to 2 oz)	Annual grasses and quackgrass.		possible grass antagonism with broadleaf herbicides, and methods to avoid reduced grass control. Allow a 75 day PHI for Poast and a 60 day PHI for Select. Refer to label for PHI of Assure II/Targa.
Select Max (clethodim)	9 to 16 fl oz (1.125 to 2 oz)			Select may injure flax when applied during bloom. A3 A5-6 E2 S2 S6 X1 Pages: 102-103, 104-105

Preharvest Herbicides

Roundup / generic glyphosate	Up to 0.75 ae See Remarks.	weeds including Canada thistle and	Physiologically mature. Seed contains 30%	Do not apply to flax grown for seed because reduced germination / vigor may occur. Use only registered formulations. Allow a 7 day PHI. A3-7 B2 X1 Pages: 102-103, 104-105
Drexel Defol (sodium chlorate)	1 gal 6SL (6 lb)		bolls should be	Contact herbicide requiring thorough coverage. Do not graze or feed treated straw. Allow a 7 day PHI.

Pages 102-103 = Herbicides resistance, Pages 104-105 = Generic and commercial names, Pages 108-110 = Crop rotation restrictions.

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
	for Fall or Spring I I for additional her			erbicide resistant canola.
Soil-Applied He	rbicides			
Treflan / generic trifluralin	1 to 2 pt 5 to 10 lb 10G (0.5 to 1 lb)	Grass and some broadleaf weeds.	PPI. Spring or Fall.	Use only 1 to 1.5 pt/A on tame mustard varieties. Adjust rate for soil type. Use only registered formulations on crambe. A1-2 B1 B6 E10 S7 Y1 Y14 Pages: 104-105, 108-110
Sonalan (ethalfluralin)	1.5 to 2.5 pt 5.5 to 9.5 lb 10G (0.55 to 0.95 lb)	Grass and some broadleaf weeds. May suppress kochia.	PPI. Fall or Spring.	Adjust rate for soil type. Poor wild oat and no wild mustard control. May result in reduced crop stand or early injury. May provide greater broadleaf weed control than Treflan/trifluralin. A1-2 B1 B6 E10 S7 Y1 Y14 Pages: 108-110
POST-Applied H	lerbicides			
Stinger / generic clopyralid	4 to 8 fl oz (1.5 to 3 oz ae)	Broadleaf weeds including Canada thistle and perennial sowthistle.	POST. Crop: 2- to 6- leaves. Annual weeds: Small. Thistle: 4 to 6 inches tall.	Apply after most thistle shoots have emerged. Allow a 50 day PHI. Allow a 7 day PHI and to graze crambe for livestock forage. Refer to label for other precautions. A3 L2 T2 Pages: 102-103, 104-105, 108-110
Assure II Targa (quizalofop)	7 to 10 fl oz (0.77 to 1.1 oz)	Annual grasses and quackgrass.	ckgrass. Crop: Refer to PHI. Clethodim: Prior to	
Poast (sethoxydim)	1 to 1.5 pt (0.2 to 0.3 lb)		bolting. Grass weeds:	
Select / generic clethodim	4 to 5 fl oz (1 to 1.25 oz)		Refer to soybean section on page 26.	bloom. Allow a 60 day PHI for Assure II and Poast. Allow a 70 day PHI for Select/clethodim.
Select Max (clethodim)	9 to 16 fl oz (1.125 to 2 oz)		20.	A3 A5-6 E2 S2 S6 X1 Pages: 102-103, 104-105
TAME MUS	TARD		•	
Treflan / generic trifluralin	1.5 pt 7 lb 10G (0.5 to 1 lb)	Grass and some broadleaf weeds.	PPI. Spring or Fall.	Adjust rate according to soil type. A1-2 B1 B6 E10 S7 Y1 Y14 Pages: 104-105, 108-110
Select / generic clethodim	4 to 6 fl oz (1 to 1.5 oz)	Annual grasses and quackgrass.	POST. Crop: Prior to bolting.	Add oil adjuvant at 1% v/v but not less than 1.25 pt/A Oil adjuvant at more than 1 qt/A is not needed. See Select Max label for detailed adjuvant
Select Max (clethodim)	9 to 16 fl oz (1.125 to 2 oz)		Refer to soybean section on page	recommendations. Allow a 70 day PHI. Avoid drift to small grain and desirable grass species A3 A5-6 E2 S2 S6 X1 Pages: 102-103, 104-105
Preharvest Herb	icides for Canola	•	•	
Reglone (diquat)	1.5 to 2 pt 2SL (0.37 to 0.5 lb)	Desiccant.	POST. Allow a 7 day PHI. Harvest no later	Add NIS at 0.25% v/v. Non-residual, contact herbicid requiring thorough coverage. Most active in hot and sunny conditions. Maximum of 1 application per season. Apply when 60 to 70% of canola seed turns

application. Pages 102-103 = Herbicides resistance, Pages 104-105 = Generic and commercial names, Pages 108-110 = Crop rotation restrictions.

than 10 days after

season. Apply when 60 to 70% of canola seed turns

green to brown stage. B8

HERBICIDE-RESISTANT CANOLA

Refer to page 40 for additional herbicides to use in conventional or herbicides resistant canola.

Clearfield Canola

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
Beyond (imazamox)	4 fl oz (0.5 oz ae)	Annual grass and broadleaf weeds.	POST. Canola: Prior to bloom. Grass and broadleaf weeds: Small.	Apply only to Clearfield canola varieties. Add NIS at 0.25% v/v + UAN at 1 to 2 qt/A. Apply with Stinger for Canada thistle control. Refer to label for weeds controlled and application information. Allow a 60 day PHI. Will not control ALS-resistant kochia. A5-6 D12 X1 Y2 Pages: 102-103, 108-110

LibertyLink Canola

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and	Paragraph	ns	
Ignite 280	22 fl oz	Annual broadleaf	POST.	Apply only to	LibertyLir	nk canola	varieties.
(glufosinate)	(0.4 lb)	weeds and control	Canola:	Apply with a registered POST grass herbicide.			
	, ,	or suppression of	Cotyledon up to	Refer to label for tank-mix information.			
		grasses.	early bolting stage.	Add AMS fertilizer at 3 lb/A.			
				Growth stage of grass weeds at application:			
			Broadleaf weeds:	Grass weed	# leaves	Inches ta	all # tillers
			Up to 3 inches tall.	Green foxtail	1 to 6	<4	2 or less
				Yellow foxtail	1 to 4	<2	prior to tillering
			Grass weeds:	Wild oat*	1 to 4	<4	1 or less
			See Remarks.	Barnyardgrass	1 to 6	<3	1 or less
				Proso millet	1 to 6	<3	1 or less
			Allow a 65 day	Vol. wheat*	1 to 4	<4	1 or less
			PHI.	Vol. barley*	1 to 3	<3	
				Vol. corn	1 to 4	<6	
				* = A second application may be required.			
				Non-residual, contact herbicide		bicide requ	uiring thorough
				coverage. Most active in hot, sunny conditions.			
				A3 A5-7 D13 S	7 X1 Pac	ges: 102-10	03

Roundup Ready Canola

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
Roundup / generic glyphosate	Maximum single application = 0.56 lb ae Maximum in-crop = 0.75 lb ae See Remarks.	Annual and perennial grass and broadleaf weeds.	injury may occur. Apply once or	3 = 4 = 24 32

Refer to page 115 for control of volunteer Roundup Ready canola, corn and soybean.

Pages 102-103 = Herbicides resistance, Pages 104-105 = Generic and commercial names, Pages 108-110 = Crop rotation restrictions.