

US Environmental Protection Agency Office of Pesticide Programs

Extension of the Protection Period for Mesotrione Exclusive Use Data (Part 2 of 4)

January 15, 2009

				T						1
		Mesotrione HRAC Group F2 / (WSSA Group 28)	0 / (4)	(9) / (2)	0 / (4)	C2 / (7)	(8) / N	C1 / (5)	E /(14)	
Perennial Ryegrass Grown	For Seed	Callisto at 3.0- 6.0 fl. oz/A Plus Adjuvant*	2,4-D	Bromoxynil	Dicamba	Diuron	Ethofumesate	Metribuzin	Oxyfluorfen	Count of Als controlling species. S, PC, or Resistance not included
Common Name	Scientific Name	Apply to weeds <5"			-					-
Amaranth, palmer	Amaranthus palmeri	Weeds	PC		1	1 :		COLUMN TOTAL AND		0
Amaranth, Powell	Amaranthus powellii	C	PC			FILENCIA				0
Amaranth, spiny	Amerenthus spinosus	C	PC	1	С	PROFITA DESCRIPTION		NAME OF TAXABLE PARTY.	С	1 2
Atriplex	Chenopodium orach	C		3	3.75			VANCOUNTY.		0
Broadleaf signalgrass	Brachlaria platphylla	C.				1		Table Street, or other Designation of the Land	С	1 1
Buckwheat, wild	Polygonum convolvulus	PC		С	С				C	3
Buffalobur	Solanum rostratium	C			С					1
Burcucumber	Sicyos angulatus	PC		С	С				lenor - I	2
Carpetweed	Mollugo verticillata	C	С		С		С		С	4
Carrot, wild	Daucus carota	C	PC		C		-			0
Chickweed, common Cocklebur, common	Stellaria media	C	C		С	1		C		3
Crabgrass, large	Xenthium strumarium Digitaria sanguinalis	C'	C	C	С				С	4
Dock, curly	Rumex crispus	PC	PC	-	С		С		С	2
Salinsoga	Galinsoga parviflora		C							1
Hemp	Cannabis sativa		C							1
forse nettle	Solanum carolinense	C								0
lorseweed/Marestall	Conyza canadensis	PC	1			PERMIT			С	1 1
limsonweed	Detura stramonium	C	С	С	C	TOTAL PROPERTY.			- c	4
(notweed, prostrate	Polygonum aviculare	PC		С	C				C	3
Cochia	Kochia scoparia	PC'	STEEL STATE	C	C			ACCUPATION OF		1
ambsquarters, common	Chenopodium album	C	C	С	C			THE REAL PROPERTY.		3
Morningglory, entireleaf; ivyleaf	Ipomoea hederacea	PC	C	С	С		1	ī	С	4
Morningglory, pitted	Ipomoea lacunosa	PC	Leges to	С					С	2
Austard, wild	Brassica kaber	С	С	С	С			C	С	5
lightshade, black	Solanum nigrum	C		С	С			1	С	3
lightshade, eastern black	Solanum ptycanthum	C		С						1
lightshade, hairy	Solanum sarracholdes	PC		С			i	1	С	2
lutsedge, yellow Pigweed, redroot	Cyperus esculentus Amaranthus retroflexus		PC	С	С					0
Pigweed, regroot	Amaranthus hybridus	1 - 5 - 1	PC		C	Hidle M.		ENTES:	С	3
lgweed, tumble	Amaranthus albus	 č	PC		C					1
okeweed, common	Phytolacca americana	PC	C		-		\rightarrow	-		1
otatoes, volunteer	Solanum spp.	C	-		ŧ		1	1		0
usley, Florida	Richardia scabra	C.	i	1	CI		î	1	С	2
lagweed, common	Ambrosia artemisiifolia	PC	С	С	C			STREET, STREET	C	3
lagweed, gient	Ambrosia trifida	C	С	C	C	-	1	-	The state of the	3
esbania, hemp	Sesbania exaltata	C		С	C			i	С	3
martweed, ladysthumb	Polygonum persicaria	C	PC	С	C			MAGIN	C	3
martweed, pale	Polygonum lepathifolium	C								0
martweed, Pennsylvania	Polygonum pensylvanicum	C	PC						C	1
unflower, common	Helianthus annuus	C		С			-	F		1
elvetleaf	Abutllon theophrasti	C	С	C	C			A HEATER	С	4
/aterhemp, common	Amaranthus rudis	 	PC PC	100					SERVICE OF	0
/aterhemp, tall	Amaranthus tuberculatus			C						

		Callisto at 6.0 fl.					1		1	
Common Name	Scientific Name	oz./A			1		-	-		
Amaranth, palmer	Amaranthus palmeri	C				1	1		j 1	0
Amarath, Powell	Amaranthus powellii	C								0
Ameranth, spiny	Amaranthus spinosus	C			1	SCALE OF STREET	1	The second	Ci	
Broadleaf signalgrass	Brachiaria platyphylla	C,				1	 	+	C	
Buffalobur	Solanum rostratum	C		•	1		1	4		,
Carpetweed	Mollugo verticillata	С		- F	1	1	T.	1	1 C	
Chickweed, common	Stellaria media	C				С	C		+ - +	2
Cocklebur, common	Xanthium strumarium	PC				PC	-	 	С	
Crabgrass, large	Digitaria sanguinalis	C		1	-	C	C	-	C	1
Galinsoga	Galinsoga parvillora	С		10		, ,	C	1	1 0	3
Jimsonweed	Datura stramonium	C		4	1	1	1			0
Kochia	Kochia scoparia	PC	SERVICE STREET		TOP STATE OF	J	1	THE PARTY	0 1	1
ambsquarters, common	Chenopodium album	C		1	DESCRIPTION .	1 C	fil .		C I	0
Morningglory, entireleaf; ivyleaf	Ipomoea hederacea	PC		_		C	-	ACCUPANT OF	C	2
Morningglory, pitted	Ipomoea lacunosa	PC		1	-	C	-	-	C	2
Nightshade, eastern black	Solanum ptycanthum	C		1	10			COLUMN TO SERVICE	0	2
Nightshade, hairy	Solanum sarrachoides	C		1	i .	1		DESCRIPTION OF		0
Pigweed, redroot	Amaranthus retroflexus	C				C	-	THE RESIDENCE AND ADDRESS OF	C	1
ligweed, smooth	Ameranthus hybridus	C		1					C 1	1
Pigweed, tumble	Amaranthus albus	C						257		0
Ragweed, common	Ambrosia artemislifolia	C		1		C	i	1008182500	C	Ü
Ragweed, glant	Ambrosia trifida	PC				C	-	HAT WITH	C	
Smartweed, ladysthumb	Polygonum persiceria	C		1-		C		COLUMN TO SERVICE STATE OF THE PERSON STATE OF	C	1
Smartweed, pale	Polygonum lapathifolium	С				c		SCHOOL ST	-	2
martweed, Pennsylvania	Polygonum pensylvanicum	Č				C		THE REAL PROPERTY.	C	1 2
Sunflower, common	Hellanthus annuus	C		4					C	2
'elvetleaf	Abutilon theophrasti	C		1		l c			C I	0
Vaterhemp, common	Amaranthus rudis	C							Name and Address of the Owner o	2
Vaterhemp, tall	Amaranthus tuberculatus	C								Ü
Count of Species Controlled in F	Perennial Ryegrass Grown For Seed	58	13	21	23	11	4	2	24	0
riteria I: Insufficient Efficaciou	s Alternative To Mesotrione.		Vac	Voe	Voc	Yes	Yes	Yes	34	
pecies not controlled by any lemative	Resistant biotypes per chemical clas mesotrione. A "C" within a pink shad and is therefore not counted as contr	led cell indicates the	partially o	controlled by	A STATE OF THE PARTY OF	res	res	res	Yes	

		77						
Characteristic	18 ASIA DESCRIBED	2'4-D	Bromoxynil	Dicamba	nonuiO	ethofumesate	(OAS) nizudintəlv	nejhuorfen ni (24C) isoé AV
EPA Reg. No.	100-1131	5905-504	42750-48	66330-276	19713-36	264-613	264_738	C C C C
Reduced Risk by EPA	Yes	S.	No	No	No.	No	N	NO NO
Label Signal Word	Caution	Caution	Warning	Danger	Warning	Caution	Caution	Warning
Gene Toxicity	Negative	Negative	Positive	Positive	Positive	Negative	Negative	Positive
Teratogenicity	Negative	Negative	Positive	Negative	Negative	Negative	Negative	Negative
Reproductive Toxicity	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative
Carcinogenic Potential	Not Likely	٥	O	٥	Known / likely	٥	0	C
Acute Neurotoxicity	Negative	Positive	Unlikely ND	Positive	QN	CX	Negative	S
Subchronic/Chronic Neurotoxicity	Negative	Positive	Unlikely ND	Positive	QN	2	Positive	2
KEI IN Hours*	12	12	24	24	12	12	12	24
PHI in Days*	14,60	7, 30	Do not feed	¥	Z	Don't graze	28	365
**PPE*	Chem resist gloves	3	3	2	-			3
Applic. Method (Pre)	Pre	ž	N.	N	Pre	Pre	- 2	Pro
Pre lbs ai./A	0.188	Z	¥	¥	0.8-1.6	1.87		0.13-0.38
Applic. Method (Post)	Post	Post	Post	Post	Post	Post	Poet	Doe
Post lbs ai./A	0.094-0.188	0.7-0.95	0.25-0.5	0.25-0.5	0.8-1.6	1.87	0 15-0 3	0 13-0 38
No. Applic. / year	1.0	_		1		-	200	
Max. Al lbs./yr	0.188	0.95	0.5	1.0	1.6	187	0.3	0.375
US or Regional label	Sn	Sn	SN	ns	2	2	200	200
**Environmental Hazard	Surface Water Advisory, runoff	8	2	2			-	2 6
Criterion II: Alternative Poses		AND THE REAL PROPERTY AND THE PROPERTY A					-	2
Environmental Risk	THE CONTRACTOR OF	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* REI = Restricted Entry Interval. PHI = Pre Harvest Interval. PPE = Personal Protective Equipment

** = Ranking into 4 Classes: 0 = Better than mesotrione, 1 = similar to mesotrione, 2 = worse than mesotrione.

NL = None listed or not mentioned, or the application method is not labeled for a specific active ingredient.

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	*SIT DESTROAT	Q- + 'C	Bromoxynil	Dicamba	nonuiQ	Ethofumesate	Metribuzin	nəhoufiyxC
EPA. Reg. No.	100-1131	5905-504	34704-885	66330-276	19713-36	264-613	264-738	62719-424
HRAC / WSSA Classification of Active Ingredient Chemistry Class by Mode of Action	F 2 / (28)*	0 / (4)	C3/(6)	0 / (4)	C 2 / (7)	N / (8)	C 1 / (5)	E / (14)
Total No. Weed Species With Resistant Biotypes Per Chemistry Class in US	0	8	-	8	7	5	23	2
No. of Biotypes Controlled or Partially Controlled by Mesotrione		2	0	2	e,	0	41	8
Criterion III: Mesotrione will play role in managing Pest Resistance to this Active		Yes	No	Yes	Yes	O.	Yes	Yes
Criterion III: Mesotrione will play a role in managing pest resistance in Perennial Ryegrass Grown For Seed	YES							

Active Ingredient	EPA Classified As Reduced Risk	Criterion I: Insufficient Efficacious Alternative To Mesotrione	Criterion II: Alternative Poses Greater Human Or Environmental Risk*	Criterion III: Mesotrione Will Play Role In Managing Pest Resistance To This Active
Mesotrione	Yes	# EAST 1 (1784) . 600		
2, 4 - D	No	Yes	Yes	Yes
Bromoxynil	No	Yes	Yes	No
Dicamba	No	Yes	Yes	Yes
Diuron	No	Yes	Yes	Yes
Ethofumesate	No	Yes	Yes	No
Metribuzin	No	Yes	Yes	Yes
Oxyfluorfen	No	Yes	Yes	Yes

Grasses Grown For Seed: Kentucky Bluegrass

US Kentucky Bluegrass grown for seed is estimated to be 141,760 acres by Extension Weed Specialist at OR State University, qualifying it as a minor crop. Mesotrione was registered on Kentucky bluegrass grown for seed on March 17, 2008, which is within the first 7 years after the initial June 4, 2001 registration of mesotrione. On May 20, 2008 EPA granted mesotrione Reduced Risk status on Kentucky Bluegrass grown for seed.

Conclusion:

Mesotrione fulfils FIFRA Criteria I, II, and/or III compared to each registered alternative.

Criterion I: Mesotrione provides low rate (0.188 lbs.ai/A) preemergence or (0.094 – 0.188 lbs.ai/A) postemergence control of a large number of broadleaf weeds. Of the seven potential alternatives, none provide as broad a spectrum of weed control. As to the weeds included on mesotrione's label, some are not controlled by any other product; most are controlled by only 1 to 3 other products, and only a few by multiple products. No one product provides a broad spectrum of weed control comparable to mesotrione.

Criterion II: Mesotrione is safer across the human safety, environmental impact and application criteria than any other alternative.

Criterion III: No weeds have developed resistant biotypes to the mesotrione family of chemistry. Thus, mesotrione will manage resistance that has developed for most of the alternative families of chemistry. The exceptions are bromoxynil and ethofumesate, whose resistant biotypes are not controlled by mesotrione.

Kentucky Bluegrass Grown For Seed: Mesotrione Meets FIFRA Section 3(c)(1)(F)(ii) Criteria I, II, and III.

			Criterion II:	
	EPA	Criterion I:	Alternative	Criterion III: Mesotrione
	Classified	Insufficient	Poses Greater	Will Play Role In
	As	Efficacious	Human Or	Managing Pest
Active	Reduced	Alternative To	Environmental	Resistance To This
Ingredient	Risk	Mesotrione	Risk*	Active
Mesotrione	Yes			
2, 4 - D	No	Yes	Yes	Yes
Bromoxynil	No	Yes	Yes	No
Dicamba	No	Yes	Yes	Yes
Diuron	No	Yes	Yes	Yes
Ethofumesate	No	Yes	Yes	No
Metribuzin	No	Yes	Yes	Yes
Oxyfluorfen	No	Yes	Yes	Yes

^{*}Combined evaluation of human safety, application rate, and environmental impact.

Callisto at 3.0- 6.0 fl. oz/A	Table 1: FIFRA Excl	usive Use Extension						ous Alt	ernativ	es To N	/lesotrione
HRAC Group P2 F2 / (WSSA Group 28)		On	Kentucky Blue	grass (Grown I	For See	d.			_	
Callisto at 3.0- Callisto at			HRAC Group	G.	(9)	G	6	69	(2)	(4)	
Calilisto at 3.0				0	33/	7)/6	327	2	12) :	
Common Name Scientific Name Weeds C5							- 0	sate			Count of Als
Common Name Scientific Name Weeds C5	Kentucky Bluegrass Gro	own For Seed	6.0 fl. oz/A	2,4-D	Bromoxyn	Dicamba	Diuron	Ethofume	Metribuzin	Oxyfluorfe	species. S, PC, or Resistance not included.
Amaranth, palmer	Common Name	Scientific Name	weeds <5"								
Amaranth, Powell				-	1	1					1
Amaranth sprny											
Alriplex	The state of the s			0.0000000000000000000000000000000000000	1						
Broadlerd signalgrass				FC					THE LOCKS	C	1
Buckwheat, wild			and the same of th		1	1 :				_	
Buffelobur			CONTRACTOR OF THE PARTY OF THE	-	-	-					
Burcucumber					U			-		C	-
Carpotweed	The second secon			-	C						Annual Control
Carrot, wild			C	C						-	
Chickweed_common Stellaria media C			C	1070				·			A
Cocklebur, common	Chickweed, common		С						C	1	
Crabgrass, large Digitaria sanguinalis C¹ C C C C C C C C C C C C C T T Dock, curly Rumex crispus PC C C C T	Cocklebur, common	Xanthium strumarium	С		С		- 1			C	La contraction of the contractio
Deck, curly	Crabgrass, large	Digitaria sanguinalis	C¹								
Galinsoga Galinsoga parviflora C	Dock, curly			PC		C					
Hemp	Galinsoga		С								Accessed to the second
Horse nette			С								
Horseweed/Marestail	Horse nettle	Solanum carolinense	С	J 1980 0		E 57					E C
Jimsonweed	Horseweed/Marestail		PC	1						C	
Knothia	Jimsonweed		С	С	С	C	1				
Comment	Knotweed, prostrate	Polygonum aviculare	PC								-
Lambsquarters, common Chenopodium album C	Kochia	Kochia scoparia	PC'		C	0			A Milester		
Morningglory, entireleaf; ivyleaf Ipomoea spp. PC C C C C A Morningglory, pitted Ipomoea lacunosa PC C C	Lambsquarters, common	Chenopodium album	С	C							The second secon
Morningglory, pitted Ipomoea lacunose PC			PC						STREET	С	
Mustard, wild Brassica kaber C C C C C C S Nightshade, black Solanum nigrum C C C C C C 3 Nightshade, eastern black Solanum sarrachoides C C C C 2 Nightshade, halry Solanum sarrachoides C C C C 2 Nutsedge, yellow Cyperus esculentus PC C C C 2 Pigweed, redroot Amaranthus retroflexus C PC C C 3 Pigweed, smooth Amaranthus sibus C PC C C 3 Pigweed, tumble Amaranthus sibus C PC C C 1 Pokeweed, common Phytolacca americana PC C C C 1 Potaley, Florida Rilchardia scabra C¹ C C C 2 Potaley, Florida Rilchardia scabra C¹ C			PC						-		the same of the sa
Nightshade, black Solanum nigrum C	Mustard, wild	Brassica kaber	C	С	C	C		-	С		
Nightshade, hairy Solanum sarrachoides C C C C 2 Nutsedge, yellow Cyperus esculentus PC 0 Pigweed, redroot Amaranthus retroflexus C PC C C C 3 Pigweed, smooth Amaranthus hybridus C PC C C C 3 Pigweed, tumble Amaranthus sabus C PC C C 1 Polymeed, tumble Amaranthus albus C PC C C 1 Polymeed, common Phytolacca americana PC C C C 1 Polymeed, common Phytolacca americana PC C C C C C C C C C C C C C C C C C C					C	C		- 1			
Nutsedge, yellow Cyperus esculentus PC Pigweed, redroot Amaranthus retroflexus C PC C C C 3 Pigweed, smooth Amaranthus hybridus C PC C C 1 Pigweed, tumble Amaranthus albus C PC C C 1 Postewed, tumble Amaranthus albus C PC C 1 Postewed, common Phytolacca americana PC C 1 Postewed, common Phytolacca americana PC C C C C C C C C C C C C C C C C C C											1
Pigweed, redroot Amaranthus retroflexus C PC C C 3 Pigweed, smooth Amaranthus hybridus C PC C 1 Pigweed, tumble Amaranthus albus C PC C C Pokeweed, common Phytolacca americana PC C C 1 Potatoes, volunteer Solanum spp. C <					С			1	í	С	2
Pigweed, smooth											0
Pigweed, tumble					С		JE4984			C	3
Pokeweed, common			Andrew Committee of the	0.000					Carried St		
Polatoes, volunteer		Control of the Contro				С					
Pusiley, Florida Richardia scabra C' C C 2 Ragweed, common Ambrosia artemislifolia PC C C C C 3 Ragweed, glant Ambrosia trifilda C C C C C 3 Sesbania, hemp Sesbania exaltata C C C C C 3 Smartweed, ladysthumb Polygonum persicaria C PC C C C 3 Smartweed, pale Polygonum lapathifolium C C C C 3 Smartweed, Pennsylvania Polygonum pensylvanicum C PC C 1 Sunflower, common Helianthus annuus C C C 1 Velvetleaf Abution theophrasti C C C C 4 Naterhemp, common Amaranthus rudis C PC C C 4 Naterhemp, tall Amaranthus tuberculatus C PC C C		Control of the Contro		C							
Ragweed, common				T.					7		
Ragweed, glant											
Sesbania Nemp Sesbania exaltata C		The second secon								C	and the second s
Smartweed, ladysthumb				C							
Commartweed				PC	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -				A CO. C. C.	C	
Smartweed, Pennsylvania Polygonum pensylvanicum C PC Sunflower, common Helianthus annuus C C C Velvetleaf Abutilon theophrasti C C C C Vaterhemp, common Amaranthus rudis C PC O Vaterhemp, tall Amaranthus tuberculatus C PC C Adjuvant = COC or NIS plus UAN or AMS 1					C	C				C	19953
Sunflower, common Helianthus annuus C C C 1 Zelvetleaf Abutilon theophrasti C C C C C C 4 Vaterhemp, common Amaranthus rudis C PC 0 0 Vaterhemp, tall Amaranthus tuberculatus C PC C 1 Adjuvant = COC or NIS plus UAN or AMS AMS				PC		T.	19				
Velvetleaf Abutilon theophrasti C C C C C 4 Naterhemp, common Amaranthus rudis C PC 0 0 Naterhemp, tall Amaranthus tuberculatus C PC C 1 Adjuvant = COC or NIS plus UAN or AMS 1									MALE PAR	U	
Waterhemp, common Amaranthus rudis C PC Vaterhemp, tall Amaranthus tuberculatus C PC C Adjuvant = COC or NIS plus UAN or AMS 1				C							
Vaterhemp, tall Amaranthus tuberculatus C PC C Adjuvant = COC or NIS plus UAN or AMS 1					٠,					0	0.000
Adjuvant = COC or NIS plus UAN or AMS					C I			1	The same of	HEADE BE	7550V
					-		+				
							-				
		17.0.11	1			-	-	-			

Common Name	Scientific Name	Callisto at 6.0 fl.					I			
Amaranth, palmer	Amaranthus palmeri	oz./A		là -	!	1			1	
Amarath, Powell	Amaranthus powellii	C	1							0
Amaranth, spiny		C	1	63	T.	ACTUAL OF				0
Broadleaf signalgrass	Amaranthus spinosus		-		-			1	C	1
	Brachiaria platyphylla	C'	1		1		i	1	C	1
Buffalobur	Solanum rostratum	С	1	20					55	0
Carpetweed	Mollugo verticillata	С			İ	1	i	i	C	1
Chickweed, common	Stellaria media	С				C	С			2
Cocklebur, common	Xanthium strumarium	PC				PC	1		C	1
Crabgrass, large	Digitaria sanguinalis	C,			1	С	С	1	С	3
Galinsoga	Galinsoge parvillora	С	1		2.			1	~ ;	,
Imsonweed	Datura stramonium	С	1	1	1	1	1		c i	1
Cochia	Kochia scoparia	PC	SHICKING			ł.	1		•	,
ambsquarters, common	Chenopodium album	C	-	1	THE REAL PROPERTY.	С	i		C I	0
Morningglory, entireleaf; ivyleaf	Ipomoea Spp.	PC				C		TAXABLE SALES	c	2
Morningglory, pitted	Ipomoea lacunosa	PC				C			C	2
lightshade, eastern black	Solanum ptycanthum	C		1	E			ALCOHOLD BY	•	2
lightshade, hairy	Solanum sarrachoides	С		1	F 1	i	1	AND DESCRIPTION OF	C I	1
rigweed, redroot	Amaranthus retroflexus	C				C		CARROLL	- C	1
rigweed, smooth	Amaranthus hybridus	С		i.e.	1	THE PERSON NAMED IN			•	'n
igweed, tumble	Amaranthus albus	C								0
Ragweed, common	Ambrosia artemisiifolia	C				С	i		C	1
lagweed, glant	Ambrosia trifida	PC				C			-	-
martweed, ladysthumb	Polygonum persicaria	C				C		MARKET SEZ	c +	- 2
martweed, pale	Polygonum lapathifolium	С				C				1
martweed, Pennsylvania	Polygonum pensylvanicum	С				C		PERSONAL	C	2
unflower, common	Helianthus annuus	С		t .		-				n
elvetleaf	Abutilon theophrasti	C				С			C	2
/aterhemp, common	Amaranthus rudis	С							BMASSING A	ō
	Amaranthus tuberculatus	С								0
Count of Species Controlled in I	(Y Bluegrass Grown For Seed	58	13	21	23	11	4	2	34	~
Criteria I: Insufficient Effi	cacious Alternatives To		Yes	Yes	Yes	Yes	Yes	Yes	Yes	
pp. not controlled by any ternative	Resistant biotypes per chemica mesotrione. A "C" within a pink biotypes and is therefore not co	shaded cell indicate	s that wee	ed has resis	d by		, 55	,,,,	765	

					The state of the s	The state of the s		
Characteristic	Mesotrione Reduced Risk Al	Z'4-D	Bromoxynil	Dicamba	Diuron	Ethofumesate	Metribuzin 24C	Oxyfluorfen
EPA Keg. No.	100-1131	5905-529	42750-48	66330-276	19713-36	264-613	264-738	62719-424
Reduced Risk by EPA	Yes	No	No	N _o	N _O	No	No	N
Label Signal Word	Caution	Caution	Warning	Danger	Warning	Caution	Caution	Warning
Gene Loxicity	Negative	Negative	Positive	Positive	Positive	Negative	Negative	Positive
l eratogenicity	Negative	Negative	Positive	Negative	Negative	Negative	Negative	Negative
Reproductive Loxicity	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative
Carcinogenic Potential	Not Likely	۵	ပ	٥	Known / likely	0	0	ပ
Acute Neurotoxicity Subchronic/Chronic	Negative	Positive	Unlikely ND	Positive	QN	ON	Negative	2
Neurotoxicity	Negative	Positive	Unlikely ND	Positive	S	Ç	Positive	Ş
REI in Hours*	12	12	24	24	12	12	12	24
PHI in Days*	14,60	7, 30	Do not feed	¥	Z	Don't graze	28	365
**PP*	Chem resist gloves	9	8	2	1		-	8
Applic. Method (Pre)	Pre	¥	Z	Ä	Pre	Pre	×	Pre
Pre lbs ai./A	0.188	Z	¥	¥	3.2	1.0	Z	0.13-0.38
Applic. Method (Post)	Post	Post	Post	Post	¥	Post	Post	Post
Post lbs al./A	0.094-0.188	0.7-0.95	0.25-0.5	0.25-0.5	Z	1.0	0.15-0.3	0.13-0.38
No. Applic. / year	1.0	-	-	-	-	_	-	-
Max. Al lbs./yr	0.188	1.0	0.5	1.0	3.2	1.0	0,3	0.375
US or Regional label	Sn	NS	SN	SN	R	RL	R	R
**Environmental Hazard	Surface Water Advisory, runoff	က	2	2	c			
Criterion II: Alternative Poses Greater Human or		- Company				>	To be an added to the state of	0
Environmental Kisk		Yes	Yes	Yes	Yes	× × ×	×25×	

Other registered active ingredients that are not considered as viable mesotrione alternatives: Dimethenamid, Dimethenamid-P, Flucarbazone, Fluroxypyr, MSMA, Pendimethalin, Primisulfuron, S-metolachlor, and Tribenuron-methyl. Refer to Attachment "Active Ingredients Within The Analyses Across Crops That Are Not Considered Viable Alternatives

* REI = Restricted Entry Interval. PHI = Pre Harvest Interval. PPE = Personal Protective Equipment

** = Ranking into 4 Classes: 0 = Better than mesotrione, 1 = similar to mesotrione, 2 = worse than mesotrione, 3 = much worse than mesotrione.

NL = None listed or not mentioned, or the application method is not labeled for a specific active ingredient

	*Sind Destroy	G- ₽'Z	Bromoxynil	Dicamba	Diuron	Ethofumesate	nizudiriəM	nəhoufiyxC
EPA. Reg. No.	100-1131	29	34704-885	66330-276	19713-36	264-613	264-738	62719-424
HRAC/ WSSA Classification of Active Ingredient Chemistry Class by Mode of	The second secon						14 to 15 to	
Action	F 2 / (28)*	0 / (4)	C 3 / (6)	0 / (4)	C21(7)	N / (8)	C 1 / (5)	E/(14)
Total No. Weed Species With Resistant Biotypes Per Chemistry Class In US	0	ω	_	80	7	5	23	
No. of biotypes Controlled or Partially Controlled by Mesotrione		2	0	2	m	0	4	2
Criterion III: Mesotrione will play role in managing Pest Resistance to this Active		Yes	ON	Yes	Yes	S N	Yes	Yes
Criterion III: Mesotrione will play a role in managing pest resistance in Kentucky Bluegrass Grown For Seed	YES	The state of the s						
		The state of the s			The second secon		The contract of the contract o	

Active Ingredient	EPA Classified As Reduced Risk	Criterion I: Insufficient Efficacious Alternative To Mesotrione	Criterion II: Alternative Poses Greater Human Or Environmental Risk*	Criterion III: Mesotrione Will Play Role In Managing Pest Resistance To This Active
Mesotrione	Yes			
2, 4 - D	No	Yes	Yes	Yes
Bromoxynil	No	Yes	Yes	No
Dicamba	No	Yes	Yes	Yes
Diuron	No	Yes	Yes	Yes
Ethofumesate	No	Yes	Yes	No
Metribuzin	No	Yes	Yes	Yes
Oxyfluorfen	No	Yes	Yes	Yes

Grasses Grown For Seed: Tall Fescue

US Tall Fescue grown for seed is estimated to be 168,290 acres by Extension Weed Specialist at OR State University, qualifying it as a minor crop. Mesotrione was registered on tall fescue grown for seed on March 17, 2008, which is within the first 7 years after the initial June 4, 2001 registration of mesotrione. On May 20, 2008 EPA granted mesotrione Reduced Risk status for tall fescue grown for seed.

Conclusion:

Mesotrione fulfils FIFRA Criteria I, II, and/or III compared to each registered alternative.

Criterion I: Mesotrione provides low rate (0.188 lbs.ai/A) preemergence or (0.094 – 0.188 lbs. ai/A) postemergence control of a large number of broadleaf weeds. Of the seven potential alternatives, none provide as broad a spectrum of weed control. As to the weeds included on mesotrione's label, some are not controlled by any other product; most are controlled by only 1 to 3 other products, and only a few by multiple products. No one product provides a broad spectrum of weed control comparable to mesotrione.

Criterion II: Mesotrione is safer across the human safety, environmental impact and application criteria than any other alternative.

Criterion III: No weeds have developed resistant biotypes to the mesotrione family of chemistry. Thus, mesotrione will manage resistance that has developed for most of the alternative families of chemistry. The exceptions are bromoxynil and ethofumesate, whose resistant biotypes are not controlled by mesotrione.

Tall Fescue Grown For Seed: Mesotrione Meets FIFRA Section 3(c)(1)(F)(ii) Criteria I, II, and III.

Active Ingredient	EPA Classified As Reduced Risk	Criterion I: Insufficient Efficacious Alternative To Mesotrione	Criterion II: Alternative Poses Greater Human Or Environmental Risk*	Criterion III: Mesotrione Will Play Role In Managing Pest Resistance To This Active
Mesotrione	Yes			
2, 4 - D	No	Yes	Yes	Yes
Bromoxynil	No	Yes	Yes	No
Dicamba	No	Yes	Yes	Yes
Diuron	No	Yes	Yes	Yes
Ethofumesate	No	Yes	Yes	No
Metribuzin	No	Yes	Yes	Yes
Oxyfluorfen	No	Yes	Yes	Yes

^{*}Combined evaluation of human safety, application rate, and environmental impact.

		Mesotrione					-			-
		HRAC	1		i					
		Group F2/	550	_					_	
		(WSSA	4)	9)	4	5	8	(5)	/(14)	
			0 / (4)	(9) / 83	0 / (4)	(2)	(8) / N	C1 / (5)	\sim	
		Group 28)	0	_ U	0	Ü	z	Ö	ш	200 - 00-000
										Count of Al
ľ		Callisto at			i	1	Ethofumesate		_	controlling
		The second second second		Bromoxynil		1	es	.⊆	Oxyfluorfen	species. S
		3.0- 6.0 fl.	_	ŏ	Dicamba	_	Ę.	E E	ģ	PC, or
L		oz/A Plus	모	E	5	2	of	三	₹	Resistance
Tall Fecue Grown For Se	ed	Adjuvant*	2,4-D	ĕ	ă	Diuron	亩	Metribuzin	ő	not included
		Apply to								
Common Name	Scientific Name	weeds <5"								
Weeds Controlled With P	ostemergence Applications									
Amaranth, palmer	Amaranthus palmeri	С	PC	.5	10	- 3		SERVICE OF	1	0
Amaranth, Powell	Amaranthus powellii	С	PC			SPECIAL PROPERTY.				ő
Amaranth, spiny	Amaranthus spinosus	С	PC	i	C	i	1	1	C	2
Atriplex	Chenopodium orach	С			term CME	- 1	1			ō
Broadleaf signalgrass	Brachiaria platphylla	C,	- 1	É	1	į	1		c i	1
Buckwheat, wild	Polygonum convolvulus	PC		С	С				C	3
Buffalobur	Solanum rostratium	C			С		-			1
Burcucumber	Sicyos angulatus	PC		C	С		$\overline{}$	-	_	2
Carpetweed	Mollugo verticillata	C	С		C	1	C		C	4
Carrot, wild	Daucus carota	C	PC		C				8 1	0
Chickweed, common	Stellaria media	С	C		C	1	1	C	1	3
Cocklebur, common	Xanthium strumarium	C	С	C	C				C	4
Crabgrass, large	Digitaria sanguinalis	C ¹					С		C	2
Dock, curly	Rumex crispus	PC	PC		C					1
Galinsoga	Galinsoga parviflora	С	С							1
Hemp	Cannabis sativa	С	С						1	1
Horse nettle	Solanum carolinense	С								0
Horseweed/Marestail	Conyza canadensis	PC			167	SAVE			C	1
Jimsonweed	Datura stramonium	C	С	С	С			制以制元	C	4
Knotweed, prostrate Kochia	Polygonum aviculare	PC		С	C				С	3
	Kochia scoparia	PC1	ACCURATION.	С	C					1
Lambsquarters, common	Chenopodium album	С	С	С	С					3
Morningglory, entireleaf; ivyleaf	Ipomoea Spp.	PC	С	С	С				С	4
Morningglory, pitted	Ipomoea lacunosa	PC		C					C	2
Musterd, wild	Brassica kaber	С	С	С	С			С	С	5
Nightshade, black	Solanum nigrum	С		C	С				С	3
Nightshade, eastern black	Solanum ptycanthum	С		C			1	V851-1		1
Nightshade, hairy	Solanum sarrachoides	С		C				-	C	2
Nutsedge, yellow	Cyperus esculentus	PC							:5:	0
Pigweed, redroot	Amaranthus retroflexus	C	PC	C	С	STOLEN.			C	3
Pigweed, smooth	Amaranthus hybridus	С	PC		С			1000000		1
Plgweed, tumble	Amaranthus albus	C	PC		С					1
Pokeweed, common Potatoes, volunteer	Phytolacca americana	PC	C							1
otatoes, volunteer Pusley, Florida	Solanum spp.		1000		10	12	- 20	10	90	0
	Richardia scabra	C,			С	1		1	C	2
Democrat of the state of the st	Ambrosia artemislifolia	PC	С	С	С		1		C	3
esbania, hemp	Ambrosia trifida	C	С	С	С					3
	Sesbania exaltata	C		С	С				С	3
THE RESERVE OF THE PERSON NAMED IN COLUMN 1	Polygonum persicaria	C	PC	С	С	1		150/04	С	3
THE RESERVE OF THE PERSON NAMED IN	Polygonum lapathifolium	C	2020 14	40					10	0
	Polygonum pensylvanicum	С	PC					(1) (1) (1) (1)	C	1
	Hellanthus annuus	C		С						1
THE RESERVE THE PERSON NAMED IN COLUMN 2 I	Abutilon theophrasti	С	C	C	C	!		MARKA.	C	4
	Ameranthus rudis	C	PC		12	20		PROPERTY.		0
reconnectly, tall	Amaranthus tuberculatus		PC	C	- 31	1	- 1	1		1

Common Name		Callisto at 6.0								
Amaranth, palmer	Scientific Name	fl. oz./A		1		1			1	5-01
Amarath, Powell	Amaranthus palmeri					THE RESIDENCE OF THE PARTY OF T				0
	Amaranthus powellii	С			61	STREET		7000 PM		0
Amaranth, spiny	Amaranthus spinosus	C							C	1
Broadleaf signalgrass	Brachiaria platyphylla	C,						1	C	1
Buffalobur	Solanum rostratum	С								0
Carpetweed	Mollugo verticillata	С			1	1		i -	C	1
Chickweed, common	Stellaria media	С				С	С			2
Cocklebur, common	Xanthium strumarium	PC				PC			С	1
Crabgrass, large	Digitaria sanguinalis	C,				C	C		С	3
Galinsoga	Galinsoga parviflora	C			1					0
Jimsonweed	Datura stramonium	C		1	1	i	1		C I	1
Kochla	Kochia scoparia	PC	DESCRIPTION OF				1			0
ambsquarters, common	Chenopodium album	С				1 c	1		c i	2
Morningglory, entireleaf; ivyleaf	/pomoea Spp.	PC				C		THE STREET	C	2
Morningglory, pitted	Ipomoea lacunosa	PC				C	-	-	C	2
Nightshade, eastern black	Solanum ptycanthum	С		£2.				TANKS CONTRACTOR		^
Nightshade, hairy	Solanum sarrachoides	C			ł.	1	1	Part Control	CI	1
Pigweed, redroot	Amaranthus retroflexus	C			_	C		UDESIES	C	
Pigweed, smooth	Amaranthus hybridus	С							0 1	'n
Pigweed, tumble	Amaranthus albus	С						NAME OF STREET		0
Ragweed, common	Ambrosia artemisilfolia	С				С	1		C	1
Ragweed, glant	Ambrosia trifida	PC				C	1	CONTRACTOR	THE REAL PROPERTY.	1
Smartweed, ladysthumb	Polygonum persicaria	С				C		A PRODUCTION OF STREET	С	1
Smartweed, pale	Polygonum lapathifolium	С		-		C	-		-	1
Smartweed, Pennsylvania	Polygonum pensylvanicum	C				C		INSTRUCTION OF	C	
Sunflower, common	Helianthus annuus	Č			i .	·	,		0	0
/elvetleaf	Abutilon theophrasti	C	- 3	1		С	1		C I	2
Vaterhemp, common	Amaranthus rudis	C			1	•	!			0
Vaterhemp, tall	Amaranthus tuberculatus	C								0
	in Tall Fescue Grown For Seed	58	13	21	23	11	1 4	2	34	U
Criteria 1: Insufficient Effica	cious Alternatives To Mesotrione		Yes	Yes	Yes	Yes	Yes	Yes	Yes	
pecies not controlled by any	Resistant biotypes per chemical class shaded cell indicates that weed h	ss that controlled of les resistant blotype prod	r partially c	ontrolled b	v mesotrion	e. A "C" w	ithin a pink	163	165	

Me Reduc					_			
	ione Risk Al	G-4-D	Bromoxynil	Dicamba	Diuron	Ethofumesæte	O∳S nizudirt∌M	Oxyfluorfen
-	131	5905-504	42750-48	66330-276	19713-36	264-613	264-738	62719-424
Reduced Risk by EPA	S	S.	No	N _o	S.	No	SN SN	No
Label Signal Word Caution	ion	Caution	Warning	Warning	Warning	Caution	Caution	Warning
Gene Toxicity Negative	tive	Negative	Positive	Positive	Positive	Negative	Negative	Positive
Teratogenicity Negative	tive	Negative	Positive	Negative	Negative	Negative	Negative	Negative
	tive	Negative	Negative	Negative	Negative	Negative	Negative	Negative
itial	kely	۵	O	۵	Known / likely	٥	0	ပ
Acute Neurotoxicity Negative	tive	Positive	Unlikely ND	Positive	2	Q	Negative	2
Neurotoxicity Negative	tive	Positive	Unlikely ND	Positive	Q	S	Positive	S
REI in Hours*	The state of the s	12	24	24	12	12	12	24
Jays*	09	7, 30	Do not feed	Z	Z	Don't graze	28	365
**PPE* Chem resist gloves	st gloves	3	3	2	-)	-	6
Applic. Method (Pre)		¥	Z	¥	Pre	Pre	N	Pre
	38	¥	Z	¥	1.6-3.2	1.87	N N	0 13-0 38
d (Post)	**	Post	Post	Post	Post	Post	Post	Post
Post lbs ai./A 0.094-0.188).188	0.7-0.95	0.25-0.5	0.25-0.5	1.6-3.2	1.87	0.25-0.38	0 13-0 38
ar		-	-	-	-	The second secon	1	-
	82	0.95	0.5	1.0	3.2	1.87	0.38	0.375
US or Regional label US		SN	Sn	Sn	R	R	2	2
Surface Water Advisory, **Environmental Hazard runoff	er Advisony, off	3	2	2	0	0	_	၉
Criterion II: Alternative								
Poses Greater Human or Environmental Risk		80	>	>	3	>	;	;
- The same of the	-	S	res	res	Yes	Yes	Yes	Yes
Other registered active ingredients that are not considered as viable mesotrione alternatives: Dimethenamid, Dimethenamid-P, Fluroxypyr, Glyphosate, MSMA, Pendimethalin, S-metolachlor, and Tribenuron-methyl. Refer to Attachment "Active Ingredients Within The Analyses Across Crops That Are Not Considered Viable Alternatives To Mesotrione".	s that are not or	considered as a thyl. Refer to	viable mesotrione alternatives: Attachment "Active Ingredients Alternatives To Mesotrione"	alternatives: Dir Ingredients W Mesotrione".	methenamid, Dime ithin The Analyses	thenamid-P, Flur Across Crops Th	oxypyr, Glyphosa lat Are Not Consi	ite, MSMA, dered Viabl
The I have under Interval. PHI = Pre Harvest Interval. PPE = Personal Protective Equipment ** = Ranking into A Classes: 0 = Dettor the months:	Pre narvest II	iterval. PPE =	Personal Protectiv	e Equipment			All and the second seco	

Table 3: FIFRA Exclusive Use Extension Criterion III: Mesotrione Plays Or Will Play A Significant Part In Managing Pest Resistance on Tall Fescue Grown For Seed	usive Use Exte In Managing P	nsion Cri est Resist	terion III: tance on T	Mesotrion all Fescu	Extension Criterion III: Mesotrione Plays Or Will Plage Pest Resistance on Tall Fescue Grown For Seed	Will Play or Seed	A Signific	ant Part
Characteristic	18 XSIA DOOFFIDERY	2'4-D	Bromoxynil	Dicamba	nonuid	Ethofumesate	D4S nizudiτ)⊕M	Oxyfluorfen
EPA. Reg. No.	100-1131	5905-504	34704-885	66330-276	19713-36	264-613	264-738	62719-424
HRAC / WSSA Classification of Active Ingredient Chemistry Class by Mode of Action	F 2 /(28)*	0 / (4)	C 3 / (6)	0 / (4)	C2/(7)	N / (8)	C 1 / (5)	E / (14)
Total No. Weed Species With Resistant Biotypes Per Chemistry Class in US	0	80	_	80		C	23	2
No. of biotypes Controlled or Partially Controlled by Mesotrione		2	0	2	က	0	41	2
Criterion III: Mesotrione will play role in managing Pest Resistance to this Active		Yes	ON.	Yes	Yes	, oN	Yes	Yes
Criterion III: Mesotrione will play a role in managing pest resistance in Tall Fescue Grown For Seed	YES							
* Active Ingredient classification based on H	on based on HRAC	/ WSSA . Me currently	SA. Mesotrione is WSSA 28 comp currently on Syngenta's EPA labels.	SA 28 compars EPA labels.	IRAC / WSSA. Mesotrione is WSSA 28 compared to the original classification of 27 used by EPA and currently on Syngenta's EPA labels.	al classificatio	n of 27 used by	/ EPA and

Active Ingredient	EPA Classified As Reduced Risk	Criterion I: Insufficient Efficacious Alternative To Mesotrione	Criterion II: Alternative Poses Greater Human Or Environmental Risk*	Criterion III: Mesotrione Will Play Role In Managing Pest Resistance To This Active
Mesotrione	Yes	THE THE CONTROL OF THE PROPERTY OF THE PROPERT		######################################
2, 4 - D	No	Yes	Yes	Yes
Bromoxynil	No	Yes	Yes	No
Dicamba	No	Yes	Yes	Yes
Diuron	No	Yes	Yes	Yes
Ethofumesate	No	Yes	Yes	No
Metribuzin	No	Yes	Yes	Yes
Oxyfluorfen	No	Yes	Yes	Yes

Rhubarb

US rhubarb production is estimated to be 1,800 acres by B. Zandstra (MI State University) and B. McReynolds (OR State University) qualifying it as a minor crop. Mesotrione was registered on rhubarb on March 17, 2008, which is within the first 7 years after the initial June 4, 2001 registration of mesotrione. On May 20, 2008 EPA granted mesotrione Reduced Risk status on rhubarb.

Conclusion:

Mesotrione fulfils FIFRA Criteria I, II, and/or III compared to each registered alternative.

Criterion I: Mesotrione provides low rate (0.188 lbs.ai/A) preemergence control of a large number of broadleaf weeds. Of the two potential alternatives, none provide as broad a spectrum of weed control. As to the weeds included on mesotrione's label, most are not controlled by any other product; and none are controlled by more than two products. No one product provides a broad spectrum of weed control comparable to mesotrione.

Criterion II: Mesotrione is safer across the human safety, environmental impact and application criteria than any other alternative.

Criterion III: No weeds have developed resistant biotypes to the mesotrione family of chemistry. Thus, mesotrione will manage resistance that has developed for the pronamide family of chemistry. It will not help the napropamide family whose resistant biotype is not controlled by mesotrione.

Rhubarb: Mesotrione Meets FIFRA Section 3(c)(1)(F)(ii) Criteria I, II, and III.

Active Ingredient	EPA Classified As Reduced Risk	Criterion I: Insufficient Efficacious Alternative To Mesotrione	Criterion II: Alternative Poses Greater Human Or Environmental Risk*	Criterion III: Mesotrione Will Play Role In Managing Pest Resistance To This Active
Mesotrione	Yes			
Napropamide	No	Yes	Yes	No
Pronamide	No	Yes	Yes	Yes

^{*}Combined evaluation of human safety, application rate, and environmental impact.

Table 1: FIFRA Exclusive Us	e Extension Criterion 1: Ther Rhu	e Are Insufficient Effica ubarb	cious Alte	rnatives To	Mesotrione or
				1	T
		Mesotrione HRAC	2)	_	
			3/(15)	K1 / (3)	
		Group F2 (WSSA	3/	_	
		Group 28)		×	
		If Weeds		ALL	Count of Als
		Emerged: Callisto	(I)		1
		6.0 fl. oz/A Plus	Ď	m	controlling
		Adjuvant Prior To	ä	ji	spp. S, PC
		Rhubarb	皮	au	Est., or
No. 1			Napropamide	Pronamide	Resistance
Rhubarb		Emergence	Z	<u>a</u>	not included
Common Name	Colonald None	Apply to weeds			
	Scientific Name	<5"			-
	Postemergence Application				
maranth, palmer	Amaranthus palmeri	C			0
maranth, Powell	Amaranthus powellii	C			0
maranth, spiny Atriplex	Amaranthus spinosus	C			0
droadleaf signalgrass	Chenopodium orach	C'			0
Buckwheat, wild	Brachiaria platphylla Polygonum convolvulus	PC			0
Suffalobur	Solanum rostratium	C			0
urcucumber	Sicyos angulatus	PC			0
arpetweed	Mollugo verticillata	C			0
arrot, wild	Daucus carota	C			0
hickweed, common	Stellaria media	C			0
ocklebur, common	Xanthium strumarium	C			0
rabgrass, large	Digitaria sanguinalis	C¹			0
ock, curly	Rumex crispus	PC			0
alinsoga	Galinsoga parviflora	C			0
emp	Cannabis sativa	С			0
orse nettle	Solanum carolinense	C			0
orseweed/Marestail	Conyza canadensis	PC			0
msonweed notweed, prostrate	Datura stramonium	PC			0
ochia	Polygonum aviculare	PC'			0
ambsquarters, common	Kochia scoparia	C			0
lorningglory, entireleaf; ivyleaf	Chenopodium album Ipomoea hederacea	PC			0
orningglory, pitted	Ipomoea lacunosa	PC			0
ustard, wild	Brassica kaber	C			0
ightshade, black	Solanum nigrum	С			0
ightshade, eastern black	Solanum ptycanthum	С			0
ightshade, hairy	Solanum sarrachoides	С			0
utsedge, yellow	Cyperus esculentus	PC			0
gweed, redroot	Amaranthus retroflexus	C			0
gweed, smooth	Amaranthus hybridus	C			0
gweed, tumble	Amaranthus albus	C			0
okeweed, common otatoes, volunteer	Phytolacca americana	PC			0
usley, Florida	Solanum spp. Richardia scabra	C'			0
agweed, common		PC			0
agweed, common agweed, giant	Ambrosia artemisiifolia Ambrosia trifida	C			0
esbania, hemp	Sesbania exaltata	C			0
martweed, ladysthumb	Polygonum persicaria	C			0
nartweed, pale	Polygonum lapathifolium	C			o -
martweed, Pennsylvania	Polygonum pensylvanicum	C			0
inflower, common	Helianthus annuus	С			0
elvetleaf	Abutilon theophrasti	С			0
aterhemp, common	Amaranthus rudis	C			0
aterhemp, tall	Amaranthus tuberculatus	С			0

Weeds Controlled W	ith Preemergence Applications o	f Callisto			1	
		6.0 fl. oz./A When				
Common Name	Scientific Name	Used Alone				
Amaranth, palmer	Amaranthus palmeri	C				0
Amarath, Powell	Amaranthus powellii	С				0
Amaranth, spiny	Amaranthus spinosus	С				0
Broadleaf signalgrass	Brachiaria platyphylla	C'			111	0
Buffalobur	Solanum rostratum	C				0
Carpetweed	Mollugo verticillata	С	С	C		2
Chickweed, common	Stellaria media	C	C	C		2
Cocklebur, common	Xanthium strumarium	PC				0
Crabgrass, large	Digitaria sanguinalis	C'	С	C		2
Galinsoga	Galinsoga parviflora	Č	O	, 0	•	0
Jimsonweed	Datura stramonium	C				0
Kochia	Kochia scoparia	PC				0
ambsquarters, common	Chenopodium album	C	С	C	W	2
Morningglory, entireleaf; ivyleaf	Ipomoea hederacea	PC		C - annual		_
Morningglory, pitted	Ipomoea lacunosa	PC		C - annual		3
Nightshade, eastern black	Solanum ptycanthum	C			,	1
Nightshade, hairy	Solanum sarrachoides	C		C	1 1	
Pigweed, redroot	Amaranthus retroflexus	C	С			
Pigweed, smooth	Amaranthus hybridus	C	O			iii
Pigweed, tumble	Amaranthus albus	c			Č	
Ragweed, common	Ambrosia artemisiifolia	С	S			60
Ragweed, glant	Ambrosia trifida	PC	•		č	
Smartweed, ladysthumb	Polygonum persicaria	C			č	
Smartweed, pale	Polygonum lapathifolium	С		С	1	
Smartweed, Pennsylvania	Polygonum pensylvanicum	Č			Ó	1
Sunflower, common	Helianthus annuus	C			o	
/elvetleaf	Abutilon theophrasti	C			0	
Vaterhemp, common	Amaranthus rudis	C			0	
Vaterhemp, tall	Amaranthus tuberculatus	C			0	
Count of Species Controlled		58	5	7		
Criterion 1: Insufficient Effaciou	s Alternative to Mesotrione		Yes	Yes		
pecies not controlled by any alternative	Resistant biotypes per chemical of shaded cell indicates that week	class that controlled or partia d has resistant biotypes and product.	lly controlled	by mesotrione. A	"C" within	n a p

Characteristic	Mesotrione	Napropamide	Propamide
EPA Reg. No.	100-1131	70506-36	62719-397
Reduced Risk by EPA	Yes	No	Q
Label Signal Word	Caution	Danger	Caution
Gene Toxicity	Negative	Negative	Negative
Teratogenicity	Negative	Negative	Negative
Reproductive Toxicity	Negative	Negative	Negative
Carcinogenic Potential	Not Likely	**************************************	
Acute Neurotoxicity	Negative	QN	ON
Subchronic/Chronic Neurotoxicity	Negative	2	S
REI in Hours*	12	12	24
PHI in Days*	21	N	38
**PPE*	Chem resist gloves	Chem resistant gloves	More restrictive clothing head gear
Applic. Method (Pre)	Dormant Pre	Dormant Pre	Dormant pre in established plantings
Pre lbs ai./A	0.188	4.0	10-20
Applic. Method (Post)	NF.	N No. of the last	JN
Post lbs ai./A	N	JN	Z
No. Applic. / year	The second secon	the fide.	
Max. Al lbs./yr	0.188	4.0	2.0
US or Regional label	SN	Regional: Pacific Northwest Only	Regional: OR and WA only
**Environmental Hazard	Surface Water Advisory, runoff	Standard	Standard
Greater Human or Environmental Risk		Yes	Vos

acid, Sethoxydim, and S-metolachlor. Refer to Attachment "Active Ingredients Within The Analyses Across Crops That Are Not Considered Viable Alternatives To Mesotrione".

* REI = Restricted Entry Interval. PHI = Pre Harvest Interval. PPE = Personal Protective Equipment

** = Ranking into 4 Classes: 0 = Better than mesotrione, 1 = similar to mesotrione, 2 = worse than mesotrione, 3 = much worse than mesotrione. NL = None listed or not mentioned, or application method is not labeled for a specific active ingredient.

and the second s			
Characteristic EPA. Reg. No.	Mesotione Reduced Risk Al	Napropamide 70506-36	Pronamide 62719-397
HRAC / WSSA Classification of Active Ingredient Chemistry Class by Mode of Action	F 2 / (28)*	K31(15)	K11/3)
Total No. Weed Species With Resistant Biotypes Per Chemistry Class in US	0		
No. of biotypes Controlled or Partially Controlled by Mesotrione		0	-
Criterion III: Mesotrione will play role in managing Pest Resistance to this Active		ON	Yes
Criterion III: Mesotrione will play a role in managing pest resistance in Rhubarb	YES	100 to 100 to	

Active Ingredient	EPA Classified As Reduced Risk	Criterion I: Insufficient Efficacious Alternative To Mesotrione	Criterion II: Alternative Poses Greater Human Or Environmental Risk*	Criterion III: Mesotrione Will Play Role In Managing Pest Resistance To This Active
Mesotrione	Yes			
Napropamide	No	Yes	Yes	No
Pronamide	No	Yes	Yes	Yes

Pearl Millet

US production of all millets is estimated to be 275,000 acres in the 2002 National Pesticide Use Database qualifying each as a minor crop. Specific data are not available for pearl millet as a single crop. Mesotrione was registered on pearl millet on March 17, 2008, which is within the first 7 years after the initial June 4, 2001 registration of mesotrione. On May 20, 2008 EPA granted mesotrione Reduced Risk status on pearl millet.

Conclusion:

Mesotrione fulfils FIFRA Criteria I, II, and/or III compared to each registered alternative.

Criterion I: Mesotrione provides low rate (0.188 lbs.ai/A) preemergence control of a large number of broadleaf weeds. It is the only product that can be used preemergence. Of the two potential postemergence alternatives, none provide as broad a spectrum of weed control. As to the weeds included on mesotrione's label, several are not controlled by any other product; and none are controlled by more than two products. No one product provides a broad spectrum of weed control comparable to mesotrione. While carfentrazone was granted reduced risk in 2000 on cereal grains, in 2007 its combined use on rice, barley, spring wheat, and winter wheat was less than 0.75% of the acres grown, showing that one or more factors limit it as a viable product in these crops. The limitation would also be operative in pearl millet.

Criterion II: Mesotrione is safer across the human safety, environmental impact and application criteria than any other alternative. Carfentrazone was registered in 2000 as a reduced risk product for small grains, including grain and forage millets. In the acute neurotoxicity comparison, it has a positive response compared to negative for mesotrione. Thus, mesotrione poses less human risk in at least one category.

Criterion III: No weeds have developed resistant biotypes to the mesotrione family of chemistry. Thus, mesotrione will manage resistance that has developed for the other alternative families of chemistry.

Pearl Millet: Mesotrione Meets FIFRA Section 3(c)(1)(F)(ii) Criteria I, II, and III.

Active Ingredient	EPA Classified As Reduced Risk	Criterion I: Insufficient Efficacious Alternative To Mesotrione	Criterion II: Alternative Poses Greater Human Or Environmental Risk*	Criterion III: Mesotrione Will Play Role In Managing Pest Resistance To This Active
Mesotrione	Yes			
2,4-D	No	Yes	Yes	Yes
Carfentrazone	Yes	Yes	Yes	Yes

^{*}Combined evaluation of human safety, application rate, and environmental impact.

HRAC Group F2 (WSSA Group 2) WSSA Group 2) WSSA Group 20 WSSA Group 20 WSSA Group 30 WSSA Group 20 WSSA Group 30		Wesotrione		-		
Pearl Millet Scientific Name Weeds Controlled With Postemergence Application Anaranth, paire Anaranth, proveil Anarant			HRAC Group F2 (WSSA Group	0 / (4)		
Common Name Scientific Name ≪5"	Pearl Millet		3.0 fl. oz/A Plus Adjuvant*	2,4-D	Carfentrazone Reduced Risk (Cereals)	species. S, PC Est., or Resistance no
Weeds Controlled With Postemergence Application Amaranth, palmer Amaranth, palmer Amaranth, palmer Amaranth, palmer Amaranth, powell Amaranth, powell C C C C 2 Amaranth, powell C C C C 2 Amaranth, powell C C C C C C 2 Amaranth, powell C C C C C C 2 Amaranth, powell C C C C C C 2 Amaranth, powell C C C C C C C C C C C C C C C C C C	Common Name	Scientific Name				
Amaranth, palmer						
Amaranth, Powell			C	С	C	2
Amaranth, spiny Amaranth, spiny Amaranthus spinosus C C C C 2 Arropker Chenopodium orach C C C C C C C C C C C C C C C C C C C	Amaranth, Powell					
Altiplex	Amaranth, spiny		C			
Brachiaria platohylia C Dayword Daywor	Atriplex		С	V52		#5
Duckwheat, wild	Broadleaf signalgrass	Brachiaria platphylla	C'			
Suffalcolur	Buckwheat, wild	Polygonum convolvulus	PC			
Ambeyone Mollugo verticilists C	Buffalobur		C			0
Darrot, wild	Burcucumber	Sicyos angulatus	PC			0
Chickweed_common		Mollugo verticillata		С	C	2
Cocklebur, common		Daucus carota		经满层设施的		0
Digitaria sanguinalis C Digitaria sanguinalis C Dock, curly Rumex crispus PC C C 1 Dialinsoga Gallinsoga Gallinsoga C C C C C Dialinsoga Gallinsoga Gallinsoga C C C Dialinsoga Gallinsoga C C C Dialinsoga Dialinsoga C Dialinsoga	Chickweed, common					0
Dock, curly Rumex crispus PC				C	C	2
Salinsoga Galinsoga parvillora C	Crabgrass, large	Digitaria sanguinalis	C¹			0
Femp Cannabis sativa C	Dock, curly	Rumex crispus	PC	С		1
Corese nettle	Galinsoga	Galinsoga parviflora	C	C		1
Imsonweed	Hemp	Cannabis sativa		С		1
Imsonweed		Solanum carolinense				0
Chotweed, prostrate						1
Cochia Kochia scoparia PC						1
Ambsquarters, common Chenopodium album C C C C C 2 Morningglory, entireleaf; iyyleaf Ipomoea hederacea PC C C C C 2 Morningglory, pitted Ipomoea lacunosa PC C C C 1 Mustard, wild Brassica kaber C C C C 1 Mightshade, black Solanum nigrum C C C 1 Mightshade, eastern black Solanum ptycanthum C C C 1 Mightshade, eastern black Solanum sarrachoides C C C 1 Mightshade, reality Solanum sarrachoides C C C 1 Mightshade, reality Solanum sarrachoides C C C 1 Mightshade, reality Solanum sarrachoides C C C 2 Migweed, redroot Amaranthus retroflexus C C C C 2 Migweed, smooth Amaranthus retroflexus C C C C 2 Migweed, tumble Amaranthus hybridus C C C C 2 Morningglory, entireleaf; ivyleaf Ipomoea hederacea PC C C C 2 Mightshade, hairy C C C C C 2 Migweed, redroot C C C C 2 Migweed, redroot Amaranthus setroflexus C C C C C 2 Migweed, smooth Amaranthus shubridus C C C C C 2 Migweed, tumble Amaranthus shubridus C C C C C 2 Morningglory, entireleaf; ivyleaf Ipomoea hederacea PC C C C C 2 Mightshade, hairy C C C C C 2 Mightshade, black Solanum spr. C C C C C 2 Migweed, provided Amaranthus shubridus C C C C C 2 Migweed, tumble Amaranthus shubridus C C C C 1 Magweed, common Ambrosia artemisifolia PC C C 1 Magweed, giant Ambrosia trifida C C C 1 Mightshade, eastern Silvio R C C C 1 Mightshade, hairy C C C C 2 Morningglory, entireleaf; ivyleaf C C C 1 Mightshade, hairy C C C C 2 Morningglory, entireleaf; ivyleaf C C C C 2 Morningglory, entireleaf Abution theophrasti C C C C C 2 Waterhemp, tall Amaranthus tuberculatus C C C C C 2				С		1
Morningglory, entireleaf; ivyleaf Ipomoea hederacea PC		·		C		1
Morningglory, pitted Ipomoea lacunosa PC		Chenopodium album			С	2
Mustard, wild Brassica kaber C C C 1 Ilightshade, black Solanum nigrum C C C 1 Ilightshade, eastern black Solanum ptycanthum C C C 1 Ilightshade, eastern black Solanum ptycanthum C C C 1 Ilightshade, hairy Solanum sarrachoides C C C C 1 Ilightshade, hairy Solanum sarrachoides C C C C C 1 Ilightshade, hairy Solanum sarrachoides C C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C 1 Ilightshade, hairy Solanum sarrachoides C C C 2 Ilightshade, hairy Solanum sarrachoides C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C 1 Ilightshade, hairy Solanum sarrachoides C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C C 2 Ilightshade, hairy Solanum sarrachoides C C C C C C C C C C C C C C C C C C C				С		2
Alightshade, black Solanum nigrum C C 1 Alightshade, eastern black Solanum ptycanthum C C 1 Alightshade, hairy Solanum sarrachoides C C 1 Amaranthus PC C C C C C C C C C C C C					С	1
lightshade, eastern black Solanum ptycanthum C C Idutsedge, yellow Cyperus esculentus C C C Idutsedge, yellow Cyperus esculentus C C C C C C C C C C C C C		The state of the s		С		1
Allghtshade, hairy Solanum sarrachoides C C C C 1 All stedge, yellow Cyperus esculentus PC C C C C 2 Pigweed, redroot Amaranthus retroflexus C C C C C 2 Pigweed, smooth Amaranthus hybridus C C C C C 2 Pigweed, tumble Amaranthus albus C C C C C 2 Pokeweed, common Phytolacca americana PC C C C C 2 Pokeweed, common Phytolacca americana PC C C C C C C C C C C C C C C C C C C						
Amaranthus retroflexus						
Pigweed, redroot					С	39. 15
Pigweed, smooth Amaranthus hybridus C C C C C 2 Pigweed, tumble Amaranthus albus C C C C C C 2 Pokeweed, common Phytolacca americana PC O C C C C C C C C C C C C C C C C C						
Polygonum persicaria Caratreed, pale Polygonum persicaria Polygonum persylvania Polygonum persylvanicum PC						
Poteweed, common Phytolacca americana PC 0 Potatoes, volunteer Solanum spp. C 0 Pusley, Florida Richardia scabra C' C 1 Ragweed, common Ambrosia artemisiifolia PC C 1 Ragweed, giant Ambrosia trifida C C C 1 Resbania, hemp Sesbania exaltata C C C 1 Remartweed, ladysthumb Polygonum persicaria C C C 1 Remartweed, pale Polygonum lapathifolium C C C C 1 Remartweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Remartweed, Pennsylvania Polygonum pensylvanicum C C C C 1 Remartweed Pennsylvania Polygonum pensylvanicum C C C C 2 Relevetteaf Abutilon theophrasti C C C C 2 Vaterhemp, common Amaranthus rudis C C C C 1 Vaterhemp, tall Amaranthus tuberculatus C C C C 2						
Potatoes, volunteer Solanum spp. C Pusley, Florida Richardia scabra C' C C 1 Ragweed, common Ambrosia artemisiifolia PC C C 1 Ragweed, giant Ambrosia trifida C C C C 1 Resbania, hemp Sesbania exaltata C C C 1 Imarkweed, ladysthumb Polygonum persicaria C C C 1 Imarkweed, pale Polygonum lapathifolium C C C C 1 Imarkweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imarkweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imarkweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imarkweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imarkweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imarkweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imarkweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imarkweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imarkweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imarkweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imarkweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imarkweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imarkweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imarkweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imarkweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imarkweed, Pennsylvania Polygonum pensylvanicum C C C C 2	The state of the s			C	C	
Pusiley, Florida Richardia scabra C' C 1 Ragweed, common Ambrosia artemisiifolia PC C 1 Ragweed, giant Ambrosia trifida C C C 1 Resbania, hemp Sesbania exaltata C C C 1 Imartweed, ladysthumb Polygonum persicaria C C C 1 Imartweed, pale Polygonum lapathifolium C C C 1 Imartweed, Pennsylvania Polygonum pensylvanicum C C C 2 Imartweed, Pennsylvania Polygonum pensylvanicum C C C C 2						5
Ragweed, common Ambrosia artemisiifolia PC C 1 Ragweed, giant Ambrosia trifida C C C 1 Besbania, hemp Sesbania exaltata C C C 1 Imartweed, ladysthumb Polygonum persicaria C C C 1 Imartweed, pale Polygonum lapathifolium C C C C 1 Imartweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Iunflower, common Helianthus annuus C C C C 1 Telvetleaf Abutilon theophrasti C C C C 2 Vaterhemp, common Amaranthus rudis C C C C 1 Vaterhemp, tall Amaranthus tuberculatus C C C C 2				•		
Ragweed, giant Ambrosia trifida C C C 1 Sesbania, hemp Sesbania exaltata C C 1 Imartweed, ladysthumb Polygonum persicaria C C C Imartweed, pale Polygonum lapathifolium C C C 1 Imartweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Iunflower, common Helianthus annuus C C C 1 Velvetleaf Abutilon theophrasti C C C C 2 Vaterhemp, common Amaranthus rudis C C C C 1 Vaterhemp, tall Amaranthus tuberculatus C C C C 2		THE CONTRACTOR OF THE PARTY OF				
Sesbania exalitata						A A CONTRACTOR OF THE CONTRACT
Imartweed, ladysthumb Polygonum persicaria C C C 1 Imartweed, pale Polygonum lapathifolium C C C 1 Imartweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imartweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imartweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imartweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imartweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imartweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Imartweed, Pennsylvania Polygonum pensylvanicum C					<u> </u>	
Imartweed, pale				C		
Imartweed, Pennsylvania Polygonum pensylvanicum C C C C 2 Iunflower, common Helianthus annuus C C C C C C C C C C C C C C C C C C	smartweed, pale					
Fundamental (value) Helianthus annuus C C C C 1 Yelvetleaf Abutilon theophrasti C C C C C 2 Vaterhemp, common Amaranthus rudis C C C C 1 Vaterhemp, tall Amaranthus tuberculatus C C C 2	martweed, Pennsylvania				С	the second second
Velvetleaf Abutilon theophrasti C C C C 2 Vaterhemp, common Amaranthus rudis C C C C 1 Vaterhemp, tall Amaranthus tuberculatus C C C 2	Sunflower, common					
Vaterhemp, common Amaranthus rudis C C C 1 Vaterhemp, tall Amaranthus tuberculatus C C C 2	/elvetleaf			C	С	
Vaterhemp, tall Amaranthus tuberculatus C C C 2	Vaterhemp, common					No. of the contract of the con
	Vaterhemp, tall Adjuvant COC plus UAN or AMS		C			

\$2500 PM FOR THE SECTION OF THE SECT		6.0 fl. oz./A When			
Common Name	Scientific Name	Used Alone			
maranth, palmer	Amaranthus palmeri	C			0
Amarath, Powell	Amaranthus powellii	С			0
maranth, spiny	Amaranthus spinosus	С			0
Broadleaf signalgrass	Brachiaria platyphylla	C'			0
Suffalobur	Solanum rostratum	C			0
Carpetweed	Mollugo verticillata	C			0
chickweed, common	Stellaria media	C			0
Cocklebur, common	Xanthium strumarium	PC			0
rabgrass, large	Digitaria sanguinalis	C'			0
Salinsoga	Galinsoga parviflora	C			0
imsonweed	Datura stramonium	C	第 17 号位为		0
ochia	Kochia scoparia	PC	DESIGNATION OF THE PERSONS		0
ambsquarters, common	Chenopodium album	C	MINISTER PROPERTY.		0
forningglory, entireleaf; ivyleaf	Ipomoea hederacea	PC			0
forningglory, pitted	Ipomoea lacunosa	PC			0
lightshade, eastern black	Solanum ptycanthum	C			0
lightshade, hairy	Solanum sarrachoides	C			0
igweed, redroot	Amaranthus retroflexus	C			0
igweed, smooth	Amaranthus hybridus	C			0
igweed, tumble	Amaranthus albus	C			0
agweed, common	Ambrosia artemisiifolia	C		MARINE SPECIFICAL	0
agweed, giant	Ambrosia trifida	PC			0
martweed, ladysthumb	Polygonum persicaria	C			0
martweed, pale	Polygonum lapathifolium	С			0
martweed, Pennsylvania	Polygonum pensylvanicum	С			0
unflower, common	Helianthus annuus	С			0
elvetleaf	Abutilon theophrasti	C			0
/aterhemp, common	Amaranthus rudis	С		THE STATE OF	0
/aterhemp, tall	Amaranthus tuberculatus	С	a franchis		0
ount of Species Controlled		58	27	19	
	ious Alternative to Mesotrione	+	Yes	Yes	

Characteristic	Mesotrione (Reduced Bisk A)		Carfentrazone (Reduced Risk Al for
	Mesonione (reduced Man All)	2,4-0	Cereals)
EPA Keg. No.	100-1131	62719-9	279-3241
Reduced Risk by EPA	Yes	S	Yes (Cereals)
Label Signal Word	Caution	Caution/Danger	Caution
Gene Toxicity	Negative	Negative	Negative
Teratogenicity	Negative	Negative	Negative
Reproductive Toxicity	Negative	Negative	Negative
Carcinogenic Potential	Not Likely		Not Likely
Acute Neurotoxicity	Negative	Positive	Positive
Subchronic/Chronic Neurotoxicity	Negative	Docitive	QX
REI in Hours*	12	12	42
PHI in Days*	N.	1 4	71
**PPE*	Chem resist gloves	3	
Applic. Method (Pre)	Pre	N	2
Pre lbs ai./A	0.188	N	NI
Applic. Method (Post)	N	Fully tillered to before boot stage	Post to jointing
Post lbs ai./A	N	0.24-0.95	0.034
No. Applic. / year		2	3
Max. Al lbs./yr	0.188	1.66	0.034
US or Regional label	SN	SN	180.0
**Environmental Hazard	Surface Water Advisory, runoff	3	
Criterion II: Alternative Poses Greater Human or			
Environmental Risk	the state of the s	Yes	Yes

** = Ranking into 4 Classes: 0 = Better than mesotrione, 1 = similar to mesotrione, 2 = worse than mesotrione, 3 = much worse than mesotrione.

| NL = None listed or not mentioned, or application method is not labeled for a specific active ingredient.

	-		
Characteristic	Mesotione Reduced Risk Al	2.4-D	Carfentrazone (Reduced Risk in Cereals)
EPA. Reg. No.	100-1131	62719-9	279-3241
HRAC / WSSA Classification of Active Ingredient Chemistry Class by Mode of Action	F 2 / (28)*	0 / (4)	F //14)
Total No. Weed Species With Resistant Biotypes Per Chemistry Class in US	0	8	
No. of biotypes Controlled or Partially Controlled by Mesotrione		2	2
Criterion III: Mesotrione will play role in managing Pest Resistance to this Active		Yes	Yes
Criterion III: Mesotrione will play a role in managing pest resistance in Pearl Millet	YES		

Active Ingredient	EPA Classified As Reduced Risk	Criterion I: Insufficient Efficacious Alternative To Mesotrione	Criterion II: Alternative Poses Greater Human Or Environmental Risk*	Criterion III: Mesotrione Will Play Role In Managing Pest Resistance To This Active
Mesotrione	Yes			THE RESERVE THE THE THE THE THE THE THE THE THE TH
2,4-D	No	Yes	Yes	Yes
Carfentrazone	Yes	Yes	Yes	Yes

Flax

US flax production is estimated to be 642,287 acres in the 2002 National Pesticide Use Database. Although this estimate exceeds the standard number of acres for a minor crop classification under FIFRA Section 2(ll), Syngenta is requesting classification of mesotrione as a minor use in flax because, as provided by FIFRA Section 2(ll)(2)(A) the use does not provide sufficient economic incentive to support the continuing registration of flax and insufficient alternatives are available. Mesotrione was registered on flax on January 9, 2008, which is within the first 7 years after the initial June 4, 2001 registration of mesotrione. On May 20, 2008 EPA granted mesotrione Reduced Risk status on flax. The broadleaf products primarily used in flax provide non-residual postemergence control after flax and weed emergence. Preemergence options are limited. Mesotrione is labeled for preemergence application after planting but before crop emergence. In order for preemergence applications to be effective, rainfall after application is needed, and mesotrione needs less activation moisture than alternatives, such as the recent Section 18 Spartan label. The use of mesotrione as a preemergence application is expected to be relative minor, relegated to niche areas. Thus, mesotrione will have use where kochia is a problem with current products but use will be limited when considering the entire flax crop, and the relatively high cost of the mesotrione product.

Conclusion:

Mesotrione fulfils FIFRA Criteria I, II, and/or III compared to each registered alternative.

Criterion I: Mesotrione provides low rate (0.188 lbs.ai/A) preemergence and postemergence control of a large number of broadleaf weeds. It is the only product registered for preemergence use prior to flax emergence. Of the four potential alternatives, none provide as broad a spectrum of weed control. Cloypralid is only used in combination with MCPA. As to the weeds included on mesotrione's label, some are not controlled by any other product; most are controlled by only 1 to 3 other products, and only a few by multiple products. No one product provides a broad spectrum of weed control comparable to mesotrione. In our Reduced Risk submission, 2,4-D and dicamba were included in the analysis of products being used on flax from the NPUD. An NPIRS run showed that these are not registered on flax, and therefore could not be included in this analysis.

Criterion II: Mesotrione is safer across the human safety, environmental impact and application criteria than any other alternative. As noted, an alternative, clopyralid, is better than mesotrione in one or more criteria, but not across all criteria.

Criterion III: No weeds have developed resistant biotypes to the mesotrione family of chemistry. Thus, mesotrione will manage resistance that has developed for the MCPA and clopyralid alternative family of chemistry. The exceptions are bentazon and bromoxynil, whose resistant biotypes are not controlled by mesotrione.

Flax: Mesotrione Meets FIFRA Section 3(c)(1)(F)(ii) Criteria I, II, and III.

Active Ingredient	EPA Classified As Reduced Risk	Criterion I: Insufficient Efficacious Alternative To Mesotrione	Criterion II: Alternative Poses Greater Human Or Environmental Risk*	Criterion III: Mesotrione Will Play Role In Managing Pest Resistance To This Active
Mesotrione	Yes			
Bentazon	No	Yes	Yes	No
Bromoxynil	No	Yes	Yes	No
MCPA	No	Yes	Yes	Yes
Clopyralid	No	Yes	Yes	Yes

^{*}Combined evaluation of human safety, application rate, and environmental impact.