

US Environmental Protection Agency Office of Pesticide Programs

Extension of the Protection Period for Mesotrione Exclusive Use Data (Part 1 of 4)

January 15, 2009

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#### FEDERAL EXPRESS DELIVERY

Document Processing Desk Office of Pesticide Programs (7505P) U.S. Environmental Protection Agency Room S-4900, One Potomac Yard 2777 South Crystal Drive (South Building) Arlington, VA 22202-4501

#### Attention: Ms. Joanne Miller, PM Leader Team 23, Herbicide Branch, Registration Division

# SUBJECT: EXTENSION OF PROTECTION PERIOD FOR MESOTRIONE EXCLUSIVE USE DATA

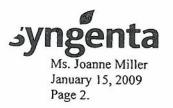
Dear Ms. Miller:

Enclosed with this letter is Syngenta Crop Protection, Inc.'s (Syngenta) submission in support of a 3-year extension of the protection period for mesotrione exclusive use data under FIFRA Section 3(c)(1)(F)(ii).

EPA granted the initial registration of mesotrione on June 4, 2001 for use in corn. Thus, the original 10-year period of exclusive use runs until June 4, 2011. Today's submission is to request that EPA extend the period of exclusive use for an additional 3 years, until June 4, 2014. There are at least 9 uses that are important tools for minor use growers and that EPA approved within the first 7 years of mesotrione's initial registration. Each of these uses meets one or more of the criteria of FIFRA Section 3(c)(1)(F)(ii).

We have included 12 crops in today's submission, to help ensure that EPA has ample basis to approve the maximum 3-year extension. EPA has granted Reduced Risk status to 11 of these 12 crops as part of its decisions on May 20, 2008 and July 15, 2008 to grant Reduced Risk status to 15 uses of mesotrione. EPA's recognition of the Reduced Risk attributes of these mesotrione uses is clear evidence that each of these uses meets the reduced risk criterion (criterion II) of FIFRA Section 3(c)(1)(F)(ii). We note that EPA denied reduced risk status to one use, sweet sorghum, only because there is no other herbicide currently registered for this specific type of sorghum and therefore, EPA concluded that the risk could not be reduced. This is clear evidence that sweet sorghum meets the "insufficient efficacious alternative registered pesticides" criterion (criterion I) of FIFRA Section 3(c)(1)(F)(ii).

The 12 crop uses in today's submission are: asparagus, blueberry, cranberry, flax, grain sorghum, perennial ryegrass grown for seed, Kentucky bluegrass grown for seed, tall fescue grown for seed, oats, pearl millet, rhubarb and sweet sorghum. Our submission provides information demonstrating each fully satisfies at least 2 of the first 3 FIFRA Section 3(c)(1)(F)(ii) criteria. The 3 criteria are:



# (I) there are insufficient efficacious alternative registered pesticides available for the use;

(II) the alternatives to the minor use pesticide pose greater risks to the environment or human health; and

(III) the minor use pesticide plays or will play a significant part in managing pest resistance.

Syngenta has elected not to submit information to justify criterion ((IV) the minor use pesticide plays or will play a significant part in an integrated pest management program), because only 1 criterion is needed by crop and each crop is justified 1 or multiple times for criterion I, II, or III.

We hope that the following brief summary will facilitate EPA's review of the enclosed submission. Our submission begins with an introduction summarizing how the submission meets the threshold requirements of FIFRA Section 3(c)(1)(F)(ii). We then describe the methodology used to analyze each of the 12 crops included in the submission, followed by a summary of the conclusions for all 12 crops. Finally, we provide the detailed back-up for these conclusions crop-by-crop, including summary tables to facilitate review of the detailed information.

We appreciate EPA's efforts to implement this provision of FIFRA, which is intended to provide an incentive to pesticide registrants to develop and maintain uses that are vital to small groups of growers producing minor crops or minor uses of other crops. We believe that with this documentation we have fully demonstrated that mesotrione qualifies for a 3-year extension of exclusive use protection under the minor use extension provisions of FIFRA Section 3(c)(1)(F)(i) as intended by Congress. We hope that this information is helpful to EPA's and USDA's evaluation of the extension.

Please let me know if there is any further information we can provide.

Sincerely,

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John D. Abbott, Ph.D., CPH NAFTA Herbicide Team Leader

Enclosure

cc: M. Knorr (EPA Office of General Counsel)

# EXTENSION OF PROTECTION PERIOD FOR MESOTRIONE EXCLUSIVE USE DATA

### Introduction

EPA granted the initial registration of mesotrione on June 4, 2001 for use in corn. Thus, the original 10-year period of exclusive use runs until June 4, 2011. Today's submission is to request that EPA extend the period of exclusive use for an additional 3 years, until June 4, 2014. There are at least 9 minor crops or minor uses of other crops that are important tools for minor use growers and that EPA approved within the first 7 years of mesotrione's initial registration. Each of these uses meets one or more of the criteria of FIFRA Section 3(c)(1)(F)(ii).

We have included 12 crops in today's submission to help ensure that EPA has an ample basis to approve the maximum 3-year extension. EPA has granted Reduced Risk status to 11 of these 12 crops as part of its decisions on May 20, 2008 and July 15, 2008 to grant Reduced Risk status to 15 uses of mesotrione. EPA's recognition of the Reduced Risk attributes of these mesotrione uses is strong evidence that each of these uses meets the reduced risk criterion (criterion II) of FIFRA Section 3(c)(1)(F)(ii). We note that EPA did not similarly grant reduced risk status to one use, sweet sorghum, but only because there is no other herbicide currently registered for this specific type of sorghum and therefore, EPA concluded that the risk could not be reduced. This is clear evidence that sweet sorghum meets the "insufficient efficacious alternative registered pesticides criterion (criterion I) of FIFRA Section 3(c)(1)(F)(ii).

Each of the 12 crops in today's submission satisfies at least 1 the first 3FIFRA Section 3(c)(1)(F)(ii) criteria, and most satisfy all 3 of them. The 3 criteria are:

(I) there are insufficient efficacious alternative registered pesticides available for the use;

(II) the alternatives to the minor use pesticide pose greater risks to the environment or human health; and

(III) the minor use pesticide plays or will play a significant part in managing pest resistance.

Syngenta has elected not to submit information to justify criterion (IV) (*the minor use pesticide plays or will play a significant part in an integrated pest management program*), because only 1 criterion is needed by crop and each crop is justified 1 or multiple times for criteria I, II, or III.

### Methodology Used To Justify Extension For Each Crop:

For each crop, Syngenta queried NPIRS (Exhibit 1: "Key to Abbreviations Used In This Submittal.") to identify all herbicide active ingredients registered for that crop. Based on herbicidal characteristics, weed species controlled, residual activity, or other similar practical factors, Syngenta identified alternatives that would potentially compete with mesotrione and then determined whether mesotrione meets one or more of the FIFRA Section 3(c)(1)(F)(ii) criteria. The other registered active ingredients that are not considered viable alternatives are also identified for each crop. These active ingredients are not evaluated in the analysis because they are not considered possible alternatives to mesotrione from an efficacy

standpoint. Exhibit 2, "Active Ingredients Within The Analyses Across Crops That Are Not Considered Viable Alternatives To Mesotrione" contains the list of active ingredients and the reasons each is not a viable alternative to mesotrione in one or more of the 12 crops. Exhibit 3 "Mesotrione will control weed species that have developed resistant biotypes to other families of chemistry" provides information on the mode of action with the HRAC and WSSA Group classification of active ingredient considered in these analyses. The weed species that have developed resistant biotypes, obtained from the "International Survey of Herbicide Resistant Weeds", that mesotrione controls are listed to show mesotrione's contribution in controlling resistant biotypes. To aid in the selection of alternatives, actual herbicide use per crop was obtained from dmrkynetec (formerly Doane AgroTrak). The National Pesticide Use Database (2002) was queried for crops not surveyed by Doane AgroTrak to determine if the chosen alternatives are actually used on the crop. Estimates were obtained from university or commodity group crop experts for crops not available in the databases listed above.

For each of the selected active ingredients per crop, pertinent attributes were compared to mesotrione. These are shown in Tables 1 - 4 for each crop, as described below.

# Mesotrione Exclusive Use Extension: Exhibit 1 Key to Abreviations Used In This Submittal

Abreviation	Definition
HRAC	Herbicide Resistance Action Committee
WSSA	Weed Science Society of America
coc	Crop Oil Concentrate - An additive used within the spray solution
UAN	Urea Ammonia Nitrate - An additive used within the spray solution
AMS	Ammonium Sulfate - An additive used within the spray solution
NIS	Non-ionic Surfactant - An additive used within the spray solution

Mesotrione Exclusive Use Extension: Exhibit 2

Active Ingredients Within The Analyses Across Crops That Are Not Considered Viable Alternatives To Mesotrione

Registered For One Or More Crops	Reason Not An Alternative For Mesotrione In One Or More Crops
Mesotrione	Mesotrione provides preemergence and postemergence control of a many broadleaf weeds, and partial control of others. On the postemergence labe there are 32 broadleaf species controlled and 11 partially controlled. Within the preemergence section, there are 22 controlled and 5 partially controlled On the Callisto label, there are two grass species controlled both pre and postemergence. In cranberries, there are additional species unique to that crop. Application to the crop is preemergence or postemergent with Callist providing residual preemeergence control or postemergence control to weeds with following residual control.
Alachlor	Primarily a preemergence grass herbicide, with control of a very narrow broadleat spectrum. No postemergence activity. Not a viable broadleaf alternative
Bentazon	Primarilya postemergence broadleaf herbicide with no preemergence or residual soil activity. Product is not widely used. Limited spectrum. Only registered for flat and grain sorghum.
Carfentrazone	Postemergence broadleaf product applied to small weeds. Limited spectrum does not match mesotrione. Weed coverage is essential. No preemergence activity and no residual weed control of later emerging weeds. Only registered in oats, grain sorghum, and grain sorghum.
Clethodim	Postemergence grass herbicide with no broadleaf spectrum. Does not match mesotrione's weed spectrum.
Dimethenamid	Primarily a preemergence grass herbicide. No postemergence activity. Narrow broadleaf spectrum. Not a viable broadleaf alternative.
Dimethenamid- P	Primarily a preemergence grass herbicide. No postemergence activity. Narrow broadleaf spectrum. Not a viable broadleaf alternative.
Diquat	Non-selective postemergence burndown for control of grasses and broadleaf weeds. No residual activity for control of later emerging weeds. No crop selectivity Preemergence or postemergence, depending on crop, for control of certain broadleaf weeds in cortain grand. Belatively birds are listed as the second
Diuron	broadleaf weeds in certain crops. Relatively high application rates. Potential for crop injury.
Fluazifop-P- butyl	Postemergence grass herbicide with no broadleaf spectrum. Does not match mesotrione weed spectrum.
Flucarbazone	Primarily a postemergence grass herbicide in cereals and grasses grown for seed with a limited broadleaf spectrum. Short residual product of ALS mode of action with many weed species with resistant biotypes. Broadleaf spectrum is insufficient as alternative to mesotrione. Only registered in KY bluegrass grown for seed.
Fluroxypyr	Postemergence broadleaf product. Controls only weeds emerged at time of application. Activity subject to environmental conditions. Limited broadleaf spectrum in comparison to mesotrione. No residual control of later emerging weeds. Only registered in grasses grown for seed and oats.
Glufosinate	Non-selective postemergence burndown for control of grasses and broadleaf weeds. No residual activity for control of later emerging weeds. No in-season use in these crops.
Glyphosate	Non-selective postemergence burndown for control of grasses and broadleaf weeds. No residual activity for control of later emerging weeds or for in season weed control in these crops
Isoxaben	Good preemergence incorporated broadleaf spectrum. Can only be used in non- bearing crops, therefore not a viable alternative. Only registered in blueberry.

Glufosinate	Non-selective postemergence burndown for control of grasses and broadleaf weeds. No residual activity for control of later emerging weeds. No in-season use in these crops.
Glyphosate	residual activity for control of later emerging weeds or for in season weed control in these
Giyphosale	Crops
Isoxaben	Good preemergence incorporated broadleaf spectrum. Can only be used in non-bearing crops, therefore not a viable alternative. Only registered in blueberry.
Metam-sodium	A soil fumigant used prior to crop establishment for weed control. Cannot be used for in season weed control. Only registered in blueberry.
Metolachlor	Primarily a preemergence grass herbicide, with control of a very narrow broadleaf spectrum. No postemergence activity. Not a viable broadleaf alternative
MSMA	A postemergence product primiarily for grass control with no preemergence or residual activity. Not a viable broadleaf alternative.
Oxadiazon	High rate preemergence product for control of broadleaves and certain grasses. Only on ornamental cranberries, so not a viable alternative to mesotrione.
Paraquat	Non-selective postemergence burndown for control of grasses and broadleaf weeds. No residual activity for control of later emerging weeds. No in-crop use
Pelargonic Acid	Non-selective postemergence burndown for control of grasses and broadleaf weeds. No residual activity for control of later emerging weeds. No in-crop use
Pendimethalin	Primarily a preemergence grass herbicide. Limited broadleaf spectrum. Not a viable alternative to mesotrione.
Primisulfuron	A postemergence product primarily for control of certain grass weeds and certain broadleaves. Some residual activity. Spectrum differes from mesotrione. Not a viable alternative for mesotrione. Only registered in bluegrass grown for seed.
Propachlor	Primarily a preemergence grass herbicide, with very limited broadleaf spectrum. Not a viable alternative for mesotrione.
Prosulfuron	Primarily a postemergence broadleaf product with residual activity. Very limited use. Many resistant weed biotypes. Only registered for use in oats, pearl millet, and grain sorghum.
Pyrasulfotole	Very limited postemergence broadleaf spectrum, making it impractical as an alternative. Limited residual activity. Only registered for use in pats
Sethoxydim	Postemergence grass herbicide with no residual control or broadleaf spectrum. Not a viable alternative for mesotrione.
S-metolachlor	Primarily a preemergence grass herbicide, with control of a very narrow broadleaf spectrum. No postemergence activity. Not a viable broadleaf alternative
Tribenuron-methyl	Not commonly used alone. Only recommended in combination with other products for use in grasses grown for seed. Poor residual control. Many weed species with resistant biotypes. Only registered in grasses grown for seed.
Frifluralin	Primarily a preplant incorporated grass herbicide. Not a viable alternative to mesotrione.

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	Meso	rione	Exclusive Use Exte	nsion: Exhibit 3
Mesotrione V		rol Wee		Developed Resistant Biotypes To
Mode of Action ; Chemical Family	HRAC Group	WSSA	Als Included In The Analysis As Potential / Partial Alternatives To Mesotrione.	Statement of Resistance For MOA And Weed Species With Resistant Biotypes Controlled by Mesotrione - From WSSA Database.
Acetolactate synthase (ALS)	В	2	Chorsulfuron, Flucarbazone Halosulfuron-methyl, Metsulfuron-methyl, Primisulfuron, Prosulfuron, Tribenuron-methyl, Thifensulfuron, Trifloxysulfuron	Several species have developed biotypes resistant to this ALS (B / 2) group of herbicides. Mesotrione will control many of these species (Amaranth (palmer, Powell) cocklebur, chickweed, horseweed, kochia, lambsquarters, mustard, eastern black nightshade, pigweed (redroot, smooth), ragweed (common, giant), teaweed, sunflower, and waterhemps).
Photosystem II Triazines, Triazinone, Uracil	C1	5	Ametryn, Atrazine, Hexazinone, Metribuzin, Simazine, Terbacil	Several species have developed biotypes resistant to this PS II (C1 / 5) group of herbicides. Mesotrione will control many of these species (Amaranth (palmer, Powell), kochia, jimsonweed, lambsquarters, eastern black nightshade, pigweed (redroot, smooth), ragweed (common), smartweeds, teaweed, sunflower, velvetleaf, waterhemps).
Photosystem II Jrea	C2	7	Diuron, Linuron	Several species have developed biotypes resistant to this (C2 / 7) group of herbicides. Mesotrione will control several of these species including Powell amaranth, horseweed, and redroot pigweed.
Photosystem II Nitriles, penzothiadiazinone	C3	6	Bentazon, Bromoxynil	Only one species has developed a resistant biotype to this (C3 / 6) group of chemistry and it is not controlled by Mesotrione.
Protoporphyrinogen oxidase PPO	E		Carfentrazone-ethyl, Flumioxazin, Fluthiacet- methyl, Oxyfluorfen	Two species in the US have developed a resistant biotype to this (E / 14) group of herbicides (common ragweed and waterhemp) and they are controlled by mesotrione.
Carotenoid viosynthesis - vyridazinone	F1	12		No species in the US has developed a resistant biotype to this (F1 / 12) group of herbicides.
I-hydroxyphenyl - byruvate - lioxygenase (4- IPPD)	F2		Pyrasulfotole, Mesotrione	No species in the US has developed a resistant biotype to this (F2 / 27) group of herbicides.

Mode of Action ; Chemical Family	HRAC Group		Als Included In The Analysis As Potential / Partial Alternatives To Mesotrione.	Statement of Resistance For MOA And Weed Species With Resistant Biotypes Controlled by Mesotrione - From WSSA Database.
Microtubule assembly inhibition: Dinitroaniline	K1	3	Oryzalin, Pendimethalin, Pronamide, Trifluralin	Several species have developed biotypes resistant to this (K1 / 3) group of herbicides Mesotrione will control one of these - palmer amaranth.
Very Long Chain Fatty Acids (inhibition of cell division) Chloroacetamide	КЗ	15	Napropamide	One species in the US has developed a resistant biotype to this (K3 / 15) group of herbicides and it is not controlled by mesotrione.
Cell wall (cellulose) synthesis: Nitrile, Benzamide	L	20,21,2 7	Dichlobenil (20), Isoxaben (21),	No species in the US has developed a resistant biotype to this (L / 20, 21, 26) group of herbicides.
Lipid synthesis - not ACCase: Thiocarbamates	N	16	Ethofumesate	resistant to this (N / 8,26) group of herbicides. None are controlled by mesotrione.
Action like indole acetic acid: Synthetic Auxins	0	4	2,4-D, Clopyralid, Dicamba, Fluroxypyr, MCPA,	Several species have developed biotypes resistant to this (O / 4) group of herbicides. Mesotrione will control two of these - wild carrot and kochia.

Table 1 is titled "FIFRA Exclusive Use Extension Criterion I: There Are Insufficient Efficacious Alternatives To Mesotrione." This Table demonstrates that mesotrione meets FIFRA Section 3(c)(1)(F)(ii) Criterion I (Insufficient Efficacious Alternatives).

Table 1 contrasts the weed control spectrum of alternative products compared to mesotrione, based on the product labels. The full mesotrione weed spectrum is listed and then for each potential alternative product there is an indication of which of those species are on the alternative's label and the level of control (C = Control; PC = Partial Control, S= Suppression, Est. = Estimated to be controlled, and NC = No Control). Table 1 also shows information on weed biotypes that have developed and confirmed resistance to the alternative chemical family as indicated by color shading. Exhibit 3 contains the chemical family of the active ingredients, its HRAC and WSSA grouping, representative active ingredients included in the analysis and a statement concerning the resistant biotypes within the chemical family mode of action that mesotrione controls. A professional scientific-based judgement has been provided on whether there are sufficient alternatives (two active ingredients of different modes of action are needed at a minimum) to fully control a specific weed species. The column labelled "Count of Active Ingredient Controlling Species" sums the number of active ingredients that claim "Control" of the particular weed species. The other designations on the product label for level of control are not counted, since complete control does not occur. Also, if confirmed resistant biotypes occur for a weed species, the product is not considered as an alternative to mesotrione since that weed species with resistant biotypes is no longer controlled. At the bottom of Table 1, the row labelled "Count of Species Controlled" shows the number of species across application methods that each active ingredient controls. For mesotrione, there is a total of 58, compared to that of each of the other alternatives. This information is used to answer the question for Criterion I: "Insufficient efficacious alternative to Mesotrione." Syngenta provides its conclusion for each active ingredient as a "Yes" or "No".

Table 2 is titled "FIFRA Exclusive Use Extension Criterion II: Alternative Registered Pesticides Pose Greater Risks To The Environment Or Human Health Than Mesotrione." This Table shows that mesotrione meets FIFRA Section 3(c)(1)(F)(ii) criterion II (environmental or human health risks).

Table 2 compares mesotrione to the alternatives based on: whether the active ingredient and use are "reduced risk", seven human safety criteria, label statements on the active ingredient's characteristics based on human and environmental safety, comparable application methods and application rates, and evaluation of several other label statements. Some of the characteristics are compared between products using an experienced subjective comparison to mesotrione based on information from the product label. Table 2 includes a listing of the other registered active ingredients that are not considered as viable mesotrione alternatives. The information is used to answer the question for Criterion II: "Alternative Poses Greater Human Or Environmental Risk." Syngenta provides its conclusion for each active ingredient as a "Yes" or "No".

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Table 3 is titled "FIFRA Exclusive Use Extension Criterion III: Mesotrione Plays Or Will Play A Significant Part In Managing Pest Resistance." The Table shows that mesotrione meets FIFRA Section 3(c)(1)(F)(ii) criterion III (managing pest resistance).

Table 3 demonstrates mesotrione plays or will play a role in managing pest resistance by showing the mode of action of each active ingredient (HRAC and WSSA), the number of resistant biotypes reported in the US by the WSSA HRAC web site for the mode of action, the number of those weeds controlled by mesotrione, and whether mesotrione would be an effective tool in managing resistance to another active ingredient. The information is used to answer the question for Criterion III: whether "Mesotrione Will Play Role In Managing Pest Resistance To This Active". Syngenta provides its conclusion for each active ingredient as a "Yes" or "No".

# Table 4 is titled "Mesotrione Meets FIFRA Section 3(c)(1)(F)(ii) Criteria I, II, and III" and combines in summary format the information from Tables 1, 2, and 3.

Table 4 contains the active ingredients considered as potential mesotrione alternatives for each crop and whether the active is classified by EPA as "reduced risk". For each of the extension criterion (I, II, or III), it also displays Syngenta's conclusion for each active. The supporting information for this Table 4 is provided in Tables 1, 2, and 3.

Each of the 12 crops included in today's submission is presented in this format to aid in EPA's review.

# **Brief Summary:**

Syngenta's submission today provides the information necessary for EPA to confirm that Syngenta has met the requirements to extend the period of protection for mesotrione exclusive use data from June 4, 2001, to June 4, 2014. There are at least 9 uses that are important tools for minor use growers and that EPA approved within the first 7 years of mesotrione's initial registration. Syngenta has included 12 crops in today's submission, to help ensure that EPA has an ample basis to approve the maximum 3-year extension. In the same vein, Syngenta also has provided information supporting more than one of the four statutory criteria for each use, even though only one criterion is needed per crop to meet the statutory standard for the extension. As noted above, EPA itself has made determinations about these 12 uses that provide clear evidence that at least 1 of the FIFRA Section 3(c)(1)(F)(ii) criteria is met for each of the 12 uses.

The following Table titled "Submission Summary Table: Mesotrione Meets FIFRA Section 3(c)(1)(F)(ii) Criteria I, II, And III" lists the 12 crops addressed in this submission, lists mesotrione's reduced risk classification for each, and finally lists the answer to the question whether the 3 extension criteria are met for each of the crops based on the information provided in the subsequent crop-by-crop sections of today's submission.

Submission Summary Table: Mesotrione Meets FIFRA Section 3(c)(1)(F)(ii) Criteria I, II, And III.

CROP	EPA Classified Mesotrione 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 Crop
Asparagus	Yes	Yes	Yes	Yes
Blueberries	Yes	Yes	Yes	Yes
Cranberries	Yes	Yes	Yes	Yes
Grasses For See	d			17.07650
Peren. Rye	Yes	Yes	Yes	Yes
KY Blue	Yes	Yes	Yes	Yes
Tall Fescue	Yes	Yes	Yes	Yes
Rhubarb	Yes	Yes	Yes	Yes
Pearl Millet	Yes	Yes	Yes	Yes
Flax	Yes	Yes	Yes	Yes
Oats	Yes	Yes	Yes	Yes
Sorghum, Gr	Yes	Yes	Yes	Yes
Sorghum, Swt.	No	Yes		C. 17.7.0

### Asparagus

US asparagus production is estimated to be 71,602 acres in the 2002 National Pesticide Use Database, qualifying it as a minor crop. Mesotrione was registered on asparagus 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 asparagus.

#### Conclusion:

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

Criterion I: Mesotrione provides low rate (0.094-0.24 lbs.ai/A) preemergence and postemergence control of a large number of broadleaf weeds. Of the twelve 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. As noted, some alternatives, diuron, halosulfuron, linuron, napropamide are better than mesotrione in one or more, but not all, characteristics.

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 napropamide and norflurazon whose resistant biotypes are not controlled by mesotrione.

Asparagus. Me	sornoue meet	S FIFKA Secul	on 3(c)(1)(F)(ii) Cri	[2021] 2022 [2022] [2022] [2022] [2022] [2022] [2022] [2022] [2022 [2022] [20
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
Clopyralid	No	Yes	Yes	Yes
Dicamba	No	Yes	Yes	Yes
Diuron	No	Yes	Yes	Yes
Flumioxazin	No	Yes	Yes	Yes
Halosulfuron	No	Yes	Yes	Yes
Linuron	No	Yes	Yes	Yes
Metribuzin	No	Yes	Yes	Yes
Napropamide	No	Yes	Yes	No
Norflurazon	No	Yes	Yes	No
Terbacil	No	Yes	Yes	Yes
Trifluralin	No	Yes	Yes	Yes
*Combined eveluati				

#### Asparagus: Mesotrione Meets FIFRA Section 3(c)(1)(F)(ii) Criteria I, II, And III

\*Combined evaluation of human safety, application rate, and environmental impact.

	le 1: FIFRA Exclusive	Mesotrione	T	TI. The	re Are in	ISUTTICIE	ent Effic	acious	Alterna	tives To	o Mesot	trione o	n Aspai	ragus	annanan an
		mesourone											The ballies and the Work's area		(Contraction of Contraction of Contr
		HRAC Group	=	9	ŝ	C2 / (7)	E /(14)		R	íñ.	/(15)	F1 / (12)	6	8	
		F2 / (WSSA	5	2	2	~	5	5)	2	2	1	5	3		
		Group 28)	0/(4)	0 / (4)	0/(4)	8		B/2)	c21(7)	C1 / (5)	Ŷ	-	C1 / (5)	K1 / (3)	
		<b>Callisto Post</b>	······································	1						<u> </u>		ш	0	¥	
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Asparagus			4-0	8	3	Diuron	Ę	e	5	5	ă	Ę	pa	5	in si o si in
Asparagus		Adjuvant*	N	Ū	; Ö	ō	Ē	Ť	2	Ne l	Napropamide	Norflurazon	Terbacil	Trifluralin	Count of Als Controlling species. S, PC, or Resistance not included.
Common Name	Scientific Name	Apply to weeds <5"	1.200.000	4	1			10 - 10 C.C. 17				Strength of Suffrage and Suffrage			O O M L L E
	d With Postemergence Ap	weeds <5"		<u>.</u>				(	200000						
Amarenth, palmer	d with Postemergence Ap			Y COL					1						
Ameranth, Powell	Amaranthus pelmori	C	C C				Transa.	Selection in	C						2
Ameranth, spiny	Amaranthus powelli	C	C		0				C						2
Atriplex	Amaranthus apinosus	C	C		C			C	C		1.836.00.0				4
Broadleaf signalgrass	Chenopodium orach	c													0
	Brachiana platphylla	C'											С		ž
Butkwheat, wild Buffelobur	Polygonum convolvulus	PC							C						÷
Burcucumber	Solanum rostratium	C		S	C	+									+
Cerpetweed	Sicyos angulatus	PC			C			Ś	1			-			1
Carrot, wild	Mollugo verticilata	C			C				č					-	2
Chickweed, common	Daucus carola	C							0.000						ő
Cocklebur, common	Stellaria media	C			C				c				C		3
	Xanthium strumarium	C	C	C	C			C	C				· · · · · · · · · · · · · · · · · · ·		4
Crabgrass, large	Digitaria sanguinalis	C' PC							C				-		
Dock, curly	Rumex crispus		c										C		<u>2</u> 1
3alinsoga	Galinsoga parvillora	C		č	to 1000			C							2
lemp	Cennabis sativa	С						1000							
Horse nettle	Solanum carolinense	C						C					DC		0
forseweed/Marestall	Conyza conadensis	PC		C	C	BEAUTY!		8					PC		1
limsonweed	Datura stramonium	C	C	c c	- C		10000			NORD IN			00		2 3
Knotweed, prostrate	Polygonum aviculare	PC	C	and a local	C								C		3
Kochia	Kochia scoparia	PC'	127 16 h	CONTROL OF	C								-		3
ambequarters, common	Chenopodium album	c	C	100000000000000000000000000000000000000	C			1. 1.					C		0
forningglory, entireleal; ivyleaf	Ipomoea hederacea	PC	C		c			S	000						3
forningglary, pitted	Ipomoea lacunosa	PC							-						3
lusterd, wild	Brassica kabar	C	C -		C			C	č		-	-			1
lighlshade, black	Solanum nigrum	C		č	C			c					C		5
lightshade, eastern black	Selanum plycanthum	C		C									c		4
lightshede, hairy	Solanum sarrachoides	c		C								· · · · · ·	C		1
	Cyperus esculentus	PC		197718									C	-auto-10-08	2
	Amaranthus retroflexus	C	C		с	VADIN 200		C	C						0
	Ameranihus hybridus	C	C	No. Carl	C C		-	C C	C						2 -
	Ameranthus albus	C	C		C		and the second second		C		-			~ _	3
	Phytolacca americana	PC						c +							
	Solenum spp	C						<u> </u>							
	Richardia scabra	C'			с				с						0
	Ambrosis artemistifolia	PC	C	C	č	+	1917 Alex Address	C	C		-		c		3
	Ambrosia Inlida	C	C C	C	C			c				-	0		3
	Sesbania exaltata	C			C			c	C	A					
	Polygonum persicaria	C	C	S				c		the second second			C	:	3
	Polygonum lepethifolium	C	C									14 1.4m	c ·	1.	2
	Polygonum pensylvanicum	C	C	'	C			C	C				C		2
	Helianthus annuus	C	C	C	C	-	5 N	C		and the second s			9		4
	Abulilon theophrasti	C			C .			c	c						3
	Amaranthus rudis	C	-		C			252274	-7					-	
eterhemp, tall djuvant = COC or NIS plus UAN	Amaranthus tuberculatus	C			C					Contraction of the local division of the loc			and the second sec		
				and the second se											

		Pre at 6.0-7.7 ft				-	1					(i) (riad)				
Common Name	Scientific Name	oz/A		5		1			*				-			
Amaranth, palmer Amarath, Powell	Amaranthus palmeri	C					C	Marga Table	C	TROBATC		S		and the second second	1.00	
	Amaranthus powelli	C			1	STATIS			0					C		2
maranth, spiny	Ameranthus spinosus	C				1		C	C			1 3	1817245	C C		0
Broadleaf signalgrass	Brechiarie platyphylla	C,	T				10					S				3
Bullelobur	Selanum rostratum	C	-									C	C	c		3
Carpetweed	Mollugo verticilleta	C	-				6					52				0
Chickweed, common	Stellaria media	C	1	+	- 44	·····	+	+	0	C	c	C	The second second	C		5
Cocklebur, common	Xanthium strumanum	PC				PC	+	0	PC	C	C	C	C	C		8
Crabgrass, large	Digitaria sanguinalis	C'				C	-	C.	and the second s			\$	1	-		0
Balinsoga	Galinsoga parvillora	c	+		1		÷ C	- C-	C	C	c	С	c	С		8
imsonweed	Detura stramonium	c					C		C							2
lochia	Kochia scoparia	PC	NACESSARIA ST	-	a designed and the second		C	C	1.00	C		1	C		2000	2
ambsquarters, common	Chenopodium album	C	Concernance of	dour su	THE REPORT	C	- C	C		State of the		S		<u> </u>		2
forningglory, entireleal; ivyteaf	Ipomoea hederacea	PC	+			; <u>c</u>	C -	C	C	C	C	S	C	C		5
forninggiory, pitted	Ipomose lacunosa	PC	-			- C			PC			S		1		2
lightshade, eastern black	Solanum plycanthum	C		1	+			and the second second	PC			S		1	5	1
ightahade, hairy	Solanum sarrechoides	c	+				C	S (Sector)	PC	A BARREN			C			1
igweed, redroot	Amaranthus retroflexus	C	t -			0	C			1000			C			2
gweed, smooth	Amaranthus hybridus	C	t	+		6	C	C	C	C	C	S		Ĉ,	-	3
gweed, tumble	Amaranthus abus	c					C	C	C			S		T		2
lagweed, common	Ambrosia artemptelpia	- c				C	+ C	-	C			S		1		2
agweed, giant	Ambrosis Infida	PC				c	+ -	C	C	C	C	S	C			4
martwaed, ladysthumb	Polygonum persicaria	C				- C	+					100			-	1
martwood, pale	Polygonum lapathifolum	C		+		+ - C				122025		-	0	Concerning and		1
marlweed, Pennsylvania	Polygonum pensylvanicum	C	N	to a		č							C		1	2
unflower, common	Helanthus annuus	C C						c	C	C		S	C			3
sivetieat	Abution theophrasti	c		<u> </u>	Second Sec.	ē	÷	C				Sectors.			5	3
aterhemp, common	Amaranthus rudis	c						C	PC	C		C -			2	3
aterhemp, tall	Amaranthus tuberculatus	C C					c		PC	1011000		S			ç	1
ount of Species Controlled in A	sparagus	58	19	10				A CONTRACTOR	PC			S			0	)
<b>Criterion 1: Insufficient Effic</b>	clous Alternative to Mesotrione		Yes	Yes	25 Yes	11 Yes	14	15 Yes	29 Yes	2 Yes	6	5	14	8		
ecies not controlled by any smatter.	Resistant biotypes per chem mesotrione. A "C" within a pink s	ical class that control	ed or partie	ally control	and he	105	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	72	

Characteristic         Method         Characteristic         Method         Constraint         Constraint <thconstraint< th="">         Constraint         Constrai</thconstraint<>		ts. 12											
352-686         264-735         70506-36         100-849         352-317           No         No         No         No         No         No         No           Caution         Caution         Caution         Caution         No         No         No         No           Ositive         Negative         Negative         Negative         Negative         Negative         Negative         Negative         Negative         No         No         No           Ositive         Negative         Negative         Negative         Negative         Negative         Negative         Negative         No         ND         Positive         No         ND         No         ND         No         ND         No         ND         No         ND         Negative         Negative         No         ND         ND         No         ND         No         ND         ND<			Clopyralid	Dicamba	Diuron	nisexoimulŦ	nonuilusoleH	Linuron	nizudintəM	abimeqorqeV	Yorflurazon	[erbacil	նյեւնին
No         No<				66330-276	19713-36	59639-99	10163-254	352-686	264-735	70506-36	100-840	362.317	L 10 760
Caution         Caution         Caution         Caution         Caution         Caution         Caution         Danger         Warning           Ossifive         Negative         Net         Net<		Caution/		No	No	No	No	No	No	No	No	No	NO
Ossitive         Negative				Danger	Warning	Caution	Califion	Caution	Caution		Maraina		
Obsitive     Negative     Negative     Negative     Negative     Negative     Negative       Oositive     Negative     Negative     Negative     Negative     Negative     Negative       Oositive     Negative     Nogative     Negative     Negative     Negative       ND     Negative     No     No     No     No       ND     Negative     No     No     No       ND     Negative     ND     Negative     No       ND     Negative     ND     Negative     No       ND     Negative     ND     Negative     No       12     12     12     12     12       14     NL     NL     10-2.0     10-1.5     NL       1     1     2     1     1     1       Yes     NL     1.0-2.0     1.0-1.5     NL     NL       0.188     0.023-0.07     1.0-2.0     1.0-1.5     NL     NL       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1.88     0.034     0.5     0.5     N     NS       1.88     0.034     0.5     0.5     0.5<				Positive	Positive	Positive	Nenative	Nanativa	Nacativa	Negativo	Noooting		vvarning
Oositive         Negative         No	Ì	1		Negative	Negative	Positive		Negative	Negative	Negative	Nectative	Nacativa	Negative
of Likely     Not Likely     C     D     E     C     E       ND     Negative     ND     Negative     ND       ND     Negative     ND     Negative     ND       12     12     12     12     12       14     NL     NL     14     NL     5       14     NL     NL     10-20     10-20     4.0     197.3.93       14     NL     10-20     10-20     4.0     197.3.93     0.41.6       1     1     2     1     1     1     1       Yes     Yes     Yes     Yes     Yes     Yes       0.188     0.023-0.07     1.0-2.0     1.0-2.0     1.0-1.5     NL     NL       1     1     1     1     1     1     1     2       0.188     0.0294     2.0     1.0-1.5     NL     NL     NL       1     1     1     1     1     1     1       1     2     0.18     0.034     2.0     0.1     1       1     1     1     1     1     1     1       1     1     1     1     2     0     1       1     1     1 </td <td></td> <td>Neo</td> <td></td> <td>Negative</td> <td>Negative</td> <td>Positive</td> <td></td> <td>Negative</td> <td>Negative</td> <td>Negative</td> <td>Negative</td> <td></td> <td>Negative</td>		Neo		Negative	Negative	Positive		Negative	Negative	Negative	Negative		Negative
Active Neuroloxicity         Negative         Positive         ND         Negative         ND         <		j-		۵	Known / Likely	Not Likely		0	٥	ш	, U	Anna a la sera las	ς ν
Subchronic/Chronic NeurotoxicityNegativeNoNoNoNoPositiveNDNDPositiveNDPositiveNDREI in Hours*1248121212121212121212PEFPili Days*NLNL1212121212121212PFI in Days*Chem resistNLNLNLNLNLNLNLNL212121212PepE*gloves322111121112121212Splic. Method (Pres)NeesNeNeVesVesVesNe0187/3330.41.610/202Optic. Method (Pres)After TraivestVesNeNeNe10/2020.192.010/20210/202Optic. Method (Pres)After TraivestVesNeNe10/2020.25.5.5NL10/20210/20210/20210/202Ost Ibs ai./A0.0941.42/130.190.0.250.50.1890.09410/210.190.200.0Ost Ibs ai./A0.0941.42/130.190.0.250.55.5NL0.180NLNLNLNoAplic. Method0.0330.150.180.0340.1920.25.01022222So r Regional labelUSNLNLNLNLNLN				Positive	QN	QN	Negative	QN	Negative	QN	Negative	ON	QN
Tell in Hours*         12         48         12         24         12	hronic Neurotoxicity			Positive	QN	Q	Negative	QN	Positive	GN	G	Preitiva	CN
TH in Days*         NL		48	12	24	12	12	12	24	12	12	10	12	5
"PPE*         Chem resist         2         2         1         1         1         2         1         1         1         2         1         1         1         1         2         1         2         2         2         2         1         1         1         1         1         1         2         2         2         2         2         2         2         2         2         2         2         2         2         2		-	2	1	NL	14	IN	Z	AL .	IN		2	2
Applic. Method (Pre)         Yes         No         No         Yes			6	· · ·	-		ļ ,	1	-	2	2	0	R
Tre Ibs ai./A         0.188-0.24         NL         NL         NL         0.68         Yes		-	- N	No	Vae	- Nor		7	-	-	-		2
Applic. Method (Post)         After harvest         vess         vess <thvess< th=""></thvess<>	and the same of th		IN		0000	2007.0	2	Les	Yes	Yes	Yes	Yes	Yes
Ost Ibs al. A         0.094         142-19         0.19025         0.50.5         NI         0.018         0.023-0.07         1.02.20         1.01.15         NL	+	T	Yas	Vae		0.100	Z	1.0-2.0	1.0-2.0	4.0	1.97-3.93	0.4-1.6	1.0-2.0
Vo. Applic. / year       2       2       1       2       1       2       1       2       1       1       NL		+	0.10.0.25	0.26.0 5	-	Post Dormant	Post, AH	Yes	Yes	8	No	No	No
Max. All Ibs./yr       0.24       NL       0.25       0.5       3.2       0.188       0.094       2.0       1       1       2		-	07-0-01-0	0.0-62.0	NL	0.188	0.023-0.07	1.0-2.0	1.0-1.5	NL	NL	NL	N
JS or Regional label       US       US <th< td=""><td></td><td>7</td><td></td><td>-</td><td>2</td><td>-</td><td>2</td><td>3</td><td>2</td><td>-</td><td>•</td><td>2</td><td>2</td></th<>		7		-	2	-	2	3	2	-	•	2	2
"Environmental Hazard       Surface Water       03       03       05 <td>l label</td> <td></td> <td>0770</td> <td>0.0 1</td> <td>3.2</td> <td>0.188</td> <td>0.094</td> <td>2.0</td> <td>2.0</td> <td>4.0</td> <td>3.93</td> <td>2.0</td> <td>2.0</td>	l label		0770	0.0 1	3.2	0.188	0.094	2.0	2.0	4.0	3.93	2.0	2.0
*Environmental Hazard Advisory, runoff 3 1 1 0 1 1 2 0 1 1 2 2 0 1 2 2 2 2 2 2 2			3	¥	Sn	ns	SN	SD	NS	SN	SU	SN	SN
Ariterion II: Alternative Poses       7       7       7       7       1       2         Streater Human or       7       7       7       7       7       7       7       7       7       7       7       7       7       7       2       7       7       7       2       7       2       7       2       7       2       7       2       7       2       7       2       7       5       7       5       7       5       7       5       7       5       7       5       7       5       7       5       7       5       7       5       7       5       7       5       7       5       7       5       7       5       7       5       7       5       7       5       5       7       5       5       7       5       5       7       5       5       7       5		unoff 3	-	•	c	•	•	•		,			
Environmental Risk Yes	iterion II: Alternative Poses eater Human or			1			•	-	2	2	-		2
Other registered active ingredients that are not considered as viable mesotrione alternatives: Clethodim, Fluazifop-P-butyl, Sethoxydim, Diquat, Glyphosate, Paraquat, Pelargonic Acid, Pendimethalin, 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	ivironmental Risk	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
REI = Restricted Entry Interval. PHI = Pre Harvest Interval. PPE = Personal Protective Equipment	Other registered active ingredients that are not cid, Pendimethalin, and S-metolachlor. Refer	of considered as	i viable meso	trione alter	natives: Cle	ethodim, Flu	azifop-P-bu	tyl, Setho:	kydim, Diqu	lat, Glyph	osate, Par	raquat, Pel	largonic
	REI = Restricted Entry Interval. PHI = Pre Han	rvest Interval. Pu	PE = Person	al Protectiv	a Fourinme	nt one line	in eduto ed	מן עוב ואח	CUISIDE	ed viable	Alternative	es lo Mes	otrione".

Characteristic Resolutione											
IV VOIL INDONDAL	Clopyralid	Dicamba	Diuron	nisexoimul <del>1</del>	Halosulfuron	Γμητου	nizudinteM	Napropamide	Norflutazon	Terbcil	nifanfin
EPA. Reg. No. 100-1131 103	34704- 6 885	66330- 276	19713- 36	59639- 99	10163- 254	352- 686	264- 735	70506- 36	100- 849	352- 317	62719-250
HRAC / WSSA Classification of Active Ingredient Chemistry Class by Mode of Action F 2 / (28)* 0 / (4) 0	0/(4)	0/(4)	C2 (	E/	No.1 a	C2/	C1/	K3/	F1/	Ğ	
8		8	. ~	( )	38	() r	(e) 55	(61)	(71)	6	K 1/ (3)
No. of biotypes Controlled or Partially Controlled by Mesotrione 2	0	2		, ,	90 F	- 6	3 7	- 0	- 0	8	ف
Criterion III: Mesotrione will play role in managing Pest Resistance to this Active	Yes	Yes	Yes	Yes	Yes	, yes	Yes		o y	Voc Voc	-
Criterion III: Mesotrione will play a role in managing pest resistance in Asparagus YES										3	ß

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
Clopyralid	No	Yes	Yes	Yes
Dicamba	No	Yes	Yes	Yes
Diuron	No	Yes	Yes	Yes
Flumioxazin	No	Yes	Yes	Yes
Halosulfuron	No	Yes	Yes	Yes
Linuron	No	Yes	Yes	Yes
Metribuzin	No	Yes	Yes	Yes
Napropamide	No	Yes	Yes	No
Norflurazon	No	Yes	Yes	No
Terbacil	No	Yes	Yes	Yes
Trifluralin	No	Yes	Yes	Yes

### Blueberries

US blueberry production is estimated to be 69,126 acres in the 2002 National Pesticide Use Database, qualifying it as a minor crop. Mesotrione was registered on blueberries 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 blueberries.

#### 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) postemergence and residual preemergence control of a large number of broadleaf weeds. Of the ten 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. As noted, some alternatives, diuron, napropamide, oryzalin, or pronamide are better than mesotrione in one or more, but not all, characteristics.

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 the families for dichlobenil, which has no resistant biotypes, and napropamide and norflurazon, whose resistant biotypes are not controlled by mesotrione.

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
Dichlobenil	No	Yes	Yes	No
Diuron	No	Yes	Yes	Yes
Hexazinone	No	Yes	Yes	Yes
Napropamide	No	Yes	Yes	No
Norflurazon	No	Yes	Yes	No
Oryzalin	No	Yes	Yes	Yes
Pronamide	No	Yes	Yes	Yes
Simazine	No	Yes	Yes	Yes
Terbacil	No	Yes	Yes	Yes

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

\*Combined evaluation of human safety, application rate, and environmental impact.

		Mesotrione HRAC Group F2 / (WSSA Group 28)	0 / (4)	L / (20)	C2 / (7)	C1 / (5)	K3 / (15)	F1/(12)	K1/(3)	K1/(3)	C1 / (5)	C1 / (5)	
Blueberry (High bush bearing year.	). Low bush only in non-	Callisto Postemergence Directed at 6.0 fl, oz/A Plus Adjuvant*	2,4-D	Dichlobenil	Diuron	Hexazinone	Vapropamide	Vorflurazon	Oryzalin	Pronamide	Simazine	erbacil	Count of Als controlling spp. S, PC, Est., or Resitance not included
Common Name	Scientific Name	Apply to weeds <5"				T	Z	<u>z</u>	0	Δ.	S	<u> </u>	ပ်မိတ်ညိုးရှိ
Weeds Contr	olled With Postemergence App	lications				-							
Amaranth, palmer	Amaranthus palmeri	C	Est			- Constantion of the							
Amaranth, Powell	Amaranthus powellill	C	Est		No. LOW NO.								0
Amaranth, spiny	Amaranthus spinosus	C	Est			10/2012/00					C-1126-75	1201	0
Atriplex	Chenopodium orach	C	Lat						1		1		0
Broadleaf signalgrass	Brachlaria platphylia	C'											0
Buckwheat, wild	Polygonum convolvulus	PC	1		8 5		1		s - 3	1	8		0
Buffalobur	Solanum rostratium		1		i s	C			1	1			1
Burcucumber	Sicyos angulatus	PC											0
Carpetweed	Mollugo verticillata	- ič	CI		1	1	1						0
Carrot, wild	Daucus carota	- č	U		e (8	1			1				1
Chickweed, common	Stellarla media	<del>c</del>	1000	1	5 S	<b>C</b> 1	1						0
Cocklebur, common	Xanthium strumarium	- c	C			U							1
Crabgrass, large	Digitaria sanguinalis	C'	0	1			ţ						1
Dock, curly	Rumex crispus	PC	CI	1							3		0
Galinsoga	Galinsoga parvillora	c	C										1
Hemp	Cannabis sativa	- č	C			-							1
Horse nettle	Solanum carolinense	c	<b>v</b> 1			1	t		ŧ		1	,	1
Horseweed/ Marestail	Conyza canadensis	PC			NAME OF A	discone:							0
limsonweed	Datura stramonium	C	CI	1			1	37	r.				0
(notweed, prostrate	Polygonum aviculare	PC	· 1	5 31		AN INCOME.			1			The Print of	1
Kochia	Kochia scoparia	PC'	1.12000			C					-	-	
ambsquarters, common	Chenopodium album	c	C	1.1		~		1	1				0
Morningglory, entireleaf; ivy	Ipomoea hederacea	PC	Est	1		U		1	1				1
Morningglory, pitted	l/pomoea lacunosa	PC	Est										0
Austard, wild	Brassica kaber		CI	1	.15	•				21	~		0
lightshade, black	Solanum nigrum	- Č	C I	1	1	C		1	1.		ł.	1	2
lightshade, eastern black	Solanum ptycanthum	C				and some							0
lightshade, hairy	Solanum sarrachoides	- č										100	0
lutsedge, yellow	Cyperus esculentus	PC											0
igweed, redroot	Amaranthus retroflexus		CI			~	a.	t.					0
igweed, smooth	Amaranthus hybridus	- c	Est		(COMP)	C	1	l.	1				1
Igweed, tumble	Amaranthus albus	č	Est			16.2 584						12.72	0
okeweed, common	Phytolacca americana	PC	Cat										0
otatoes, volunteer	Solanum spp.	C											0
usley, Florida	Richardia scabra	C'											0
agweed, common	Ambrosia artemisiifolia	PC	C I	i i		and the second	12	2.2	14				0
lagweed, glant	Ambrosia trifida		Est			H-SALES.		1	1				1
esbania, hemp	Sesbania exaltata	- C	Est										0
martweed, ladysthumb	Polygonum persicaria	- č	CI	1				19	÷		and the second		0
martweed, pale	Polygonum lapathifolium	- č	Est	<u>.</u>	. 6	10-10-10-10-10-10-10-10-10-10-10-10-10-1		1	1		H. A.	Palifa!	1
martweed, Pennsylvania	Polygonum pensylvanicum	C	C	1	101		P.		1		ation for some of	and the second	0
unflower, common	Helianthus annuus	č	c			-				10	Part State	STATE.	1
elvetleaf	Abutilon theophrasti	- č -	c		-	CORNEL					1	1	1
aterhemp, common	Amaranthus rudis	<del>c</del>	Est	L.				1					1
/aterhemp, tail	Amaranthus tuberculatus	c	Est		. 30	1000							0
diuvant = COC			Lat		ε <b>r</b>	15				20			0
	Name and the second			1.1			100		10	12	1		

Common Name	Scientific Name	6.0 fl. oz./A When		_									
Amaranth, palmer	Amaranthus palmeri	Used Alone	1			1				-		1-	
Amarath, Powell	Amaranthus powellil	C			Est			S	( Section	1. Conte	Est		6
Amaranth, spiny	Amaranthus spinosus	C			Est			S			Est		
Broadleaf signalgrass	Brachiaria platyphylla			-	Est		1	S	i c	1	Est	1	1
Buffalobur	Solanum rostratum	C'			1	-			1		C	C	2
Carpetweed	Mollugo verticillata	С					5. <b>7</b>	3				1 0	0
Chickweed, common	Stellaria media	C		C	1	1	C	I C	I C	I C	I C	1 8	6
Cocklebur, common		С		1	C	C	C	I C	C	C	C	C	9
rabgrass, large	Xanthium strumarium	PC	124		PC			S			1 0	v	0
	Digitaria sanguinalis	C'		I C	C	1	C	1 0	1 C	1 0	l c	1 0	0
Salinsoga imsonweed	Galinsoga parviflora	C	N			1	, ,		10	10			8
ochia	Datura stramonium					25,42,73	10					0	0
	Kochia scoparia	PC	States.	1		C		S				C	0
ambsquarters, common	Chenopodium album	C		1 C	c	C	с	S	1 0	1 0			0
lomingglory, entireleaf; ivy	Ipomoea spp.	PC	- 22 - B	1	C	1	- U	I S	PC	Cannual	C	C	5
omingglory, pitted	Ipomoea lacunosa	PC			Est	1	l	S	PC	annual	Est	1	2
ightshade, eastern black	Solanum ptycanthum	C		E E	1	10000		1 3	PC		Est	-	0
Ightshade, hairy	Solanum sarrachoides	C		-	1	Real Party					Est	C	0
gweed, redroot	Amaranthus retroflexus	C		C	C	C	C	+	1	C	Est	1 1	1
gweed, smooth	Amaranthus hybridus	C			Est		C	S	C	1	Est	Part and	3
gweed, tumble	Amaranthus albus	C		1	Est	Sector of		S	C		Est	1000	0
agweed, common	Ambrosia artemisiifolia	<u> </u>		+ c	C	1 Concerns of the local division of the loca		S	C		Est	1 1	1
agweed, giant	Ambrosle trifida	PC		v	Est	55.3279		S	PC		C	C	2
martweed, ladysthumb	Polygonum persicaria	C		C	i Est	Part of the local division of the local divi			PC		Est		0
martweed, pale	Polygonum lapathifolium	C		c	Est	Section 25		[	PC		Est	C	1
nartweed, Pennsylvania	Polygonum pensylvanicum	C		c	C	horses			PC	C	Est	C	3
inflower, common	Helianthus annuus	C C				CROWN R		S	PC		C	C	2
elvetleaf	Abutilon theophrasti	č		1		No. of Concession, Name							0
aterhemp, common	Amaranthus rudis	c		1	Est			C	PC				2
aterhemp, tall	Amaranthus tuberculatus	c			12000			S			Est		0
ount of Species Controlled		58	22.0		Est	3		S			Est		0
iteria 1: Insufficient Effic	acious Alternative to Mesotione		14	8	7	4	5	4	7	7	4	4	
ecies not controlled by an emative	y Resistant biotypes per chemical of	lass that controlled or s resistant biotypes an	Yes partial	Yes y control	Yes led by m	Yes	Yes	Yes within a	Yes pink sha	Yes	Yes	Yes	

Mes Characteristic EPA Reg. No. 100 Reduced Risk by EPA 100 Label Signal Word Ca	1012121111111111111										
	Mesotrione Reduced Risk AI	2,4-D	Dichlobenil	Diuron	ənonizsxəH	əbimsqorqaV	Vorflurazon	nilszyıC	ebimsnor	ənizsmi	erbacil
	100-1131	19713-345	400-168	19713-36	352-392	70506-34	100-849	70506-43	70506-43 62719-397	100-526	352,317
	Yes	No	No	No	No	No	No	No	Nn	No	No-200
	Caution	Caution	Caution	Warning	Danger	Danger	Warning	Carition	Carition	Cartion	Contino
	Negative	-	Negative	Positive	Negative	Nenative	Nenative	Decitive	Nacativa	Nanatino	Nocotino
	Negative	-	Positive	Negative	Negative	Negative	Negative	Negative	Negative	Naciativa	Nagativa
Reproductive Toxicity Neg	Negative		Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative
tial	Not Likely	٥	Caution	Known / likely	٥	ш	U	Likely	B2	Not likely	ш
	Negative	Positive	QN	Q	QN	QN	Negative	ND	CIN	CIN	- UN
hronic	Negative	Positive	Q	Q	Q	Q	C N	e e		2 2	Decitivo
+	12	12	12	12	24	12	12	24	24	19	19
PHI in Days*	٦٢	730	N	NL	90 / 450	Z	en en	IN	IN		71
**PPE* Chen	Chem resist gloves	<del>ر</del>	2	-	6	    •	3	4   c		ł.	
od (Pre)	Pre	NL	Fall Pre	Pre	Pre	Pre	Pra	Dro	Dra	- 0	
	0.094-0.188	NL	6.0	3.2	2.0-3.0	40	3 03	209	000	21000	DIL
d (Post)	Post Direct.	Post	N	N	N	IN	NI	NIN	2.U	2.0-4.0	1.0-2.4
	0.094-0.188	0.50%	NL	N	ĪZ	Z		N			
No. Applic. / year	2	1	-	2	-	-	1	2		NL NL	F F
	0.188	1.0	6.0	3.2	30	40	2 0.0	1001		7,	-
US or Regional label	NS	RL	NS	R	NS	ns	US US	US NS	RL 2.0	US US	US US
	Surface Water Advisory, runoff	ę	<del>.</del>	c	0	c	c	c	c		
Criterion II: Alternative Poses Greater Human or Environmental Risk						2	1		5	-	-
NON I IMAN		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other registered active ingredients that are not considered as viable mesotrione alternatives: carfentrazone, clethodim, diquat, fluazifop, glufosinate, glyphosate, isoxben, metam-sodium, paraquat, pelargonic acid, sethoxydim, triclopyr, and trifluralin. Refer to Attachment "Active Ingredients Within The Analyses Across Crops That Are Not Considered viable Alternative to Anarchine to Anarchin	ts that are i n, paraqua nalyses Ac	Ints that are not considered as viable mesotrione alternatives: carfentrazone, clethodi im, paraquat, pelargonic acid, sethoxydim, triclopyr, and trifluralin. Refer to Attachme Analyses Across Croos That Are Not Considered viable Alternatives to Advances	red as viab c acid, seth That Are N	le mesotrio oxydim, tric	ne alternati slopyr, and	Ves: carfen trifluralin. F	Refer to Att	ethodim, di achment "A	quat, fluazif ctive Ingrec	op, glufosin dients Withi	ate, n The
* REI = Restricted Entry Interval. PHI = Pre Harvest Interval. PPE = Personal Protective Equipment	: Pre Harve	st Interval.	PPE = Pers	sonal Prote	ctive Equin	ment		1016.			
** = Ranking into 4 Classes: 0 = Better than mesotrione, 1 = similar to mesotrione. 2 = werse than mesotrione. 3 much were than mesotrione	than meso	trione, 1 = s	timilar to m	esotrione	2 = WORSe II	Tan mesotr	000 3 min	th under the			
NL = None listed or not mentioned, or application method is not tabeled for a specific active indredient	application	method is n	ot labeled t	or a specifi	c active inc	redient		II MOIDE II		le.	THE PROPERTY AND A DECIMAL OF A DECIMAL OF A DECIMAL OF A

Table 3: FIFRA Exclusive Use Extension Criterion III: Mesotrione Plays Or Will Significant Part In Managing Pest Resistance on Blueberries	RA Exclusive Use Extension Criterion III: Mesotrione Plays O Significant Part In Managing Pest Resistance on Blueberries	se Exte In Man	nsion ( laging	Criteric Pest R	on III: I esista	Mesotr nce on	ione P Blueb	lays O erries	r Will I	Play A	
	tsize outood the transferred to	2'4-D	Dichlobenil	Diuron	enonizexeH	Napropamide	Norflurazon	Oryzalin	Pronamide	ənizsmið	Terbcil
EPA. Reg. No.	100-1131	1381-103	400-168	19713-36	352-392	70506-34	100-849	70506-43	62719-397	100-526	352-317
HRAC / WSSA Classification of Active Ingredient Chemistry Class by Mode of Action	F 2/(28)*	O / (40	L / (20)	C2/(7)	C1 / (5)	K3/(1)5	F 1 / (12)	K17(3)	K1 / (3)	C1 / (5)	C1 / 151
Total No. Weed Species With Resistant Biotypes Per Chemistry Class in US	0	8	0	7	23	-	•	9	9	23	23
No. of biotypes Controlled or Partially Controlled by Mesotrione		N	0	3	14	0	0	-	-	14	14
Criterion III: Mesotrione will play role in managing Pest Resistance to this Active		Yes	No	Yes	Yes	°N N	No	Yes	Yes	Yes	Yes
Criterion III: Mesotrione will play a role in managing pest resistance in Blueberries	YES										
* Active Ingredient grouping based or	ased on HRAC / WSSA. Mesotrione is WSSA 28 compared to the original classification of 27 used by EPA and currently on Syngenta's EPA labels.	SSA. Mes curren	<ul> <li>A. Mesotrione is WSSA 28 compare currently on Syngenta's EPA labels.</li> </ul>	WSSA 28 genta's EF	s compare A labels.	ed to the o	riginal cla	ssificatior	n of 27 us	ed by EF	A and

Active Ingredient	EPA Classified As Reduced Risk	Criterion I: Insufficient Efficacious Alternative To Mesotrione	Criterion II: Alternative Poses Greater Human Or Environmental Risk*	(F)(ii) Criteria I, II, and III. Criterion III: Mesotrione Will Play Role In Managing Pest Resistance To This Active
Mesotrione	Yes			
2, 4 - D	No	Yes	Yes	Yes
Dichlobenil	No	Yes	Yes	No
Diuron	No	Yes	Yes	Yes
Hexazinone	No	Yes	Yes	Yes
Napropamide	No	Yes	Yes	No
Norflurazon	No	Yes	Yes	No
Oryzalin	No	Yes	Yes	Yes
Pronamide	No	Yes	Yes	Yes
Simazine	No	Yes	Yes	Yes
Terbacil	No	Yes	Yes	Yes
*Combined evalua	tion of huma	an safety, applica	tion rate, and environ	mental impact.

# Cranberries

US cranberry production is estimated to be 40,265 acres in the 2002 National Pesticide Use Database, qualifying it as a minor crop. Mesotrione was registered on cranberry on January 9, 2008, which is within the first 7 years after the initial June 4, 2001 registration of mesotrione. Prior to the Section 3 label, Callisto had Section 18 labels in MA, OR, and WA one or more years since 9/30/2004. On May 20, 2008 EPA granted mesotrione Reduced Risk status on cranberry.

#### Conclusion:

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

Criterion I: Mesotrione provides low rate (0.25 lbs.ai/A) preemergence and postemergence control of a large number of broadleaf weeds, and the specific cranberry weeds like rushes, sedges, yellow loosestrife, silverleaf, and St. John's wort. Of the six 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 a few are controlled by only 1 to 3 other 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. As noted, some alternatives, such as napropamide are better than mesotrione in one or more, but not all, characteristics.

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

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 Wil Play Role In Managing Pest Resistance To This Active
Mesotrione	Yes			
2, 4 - D	No	Yes	Yes	Yes
Clopyralid	No	Yes	Yes	Yes
Dichlobenil	No	Yes	Yes	No
Napropamide	No	Yes	Yes	No
Norflurazon	No	Yes	Yes	No
Simazine	No	Yes	Yes	Yes

		Mesotrione				ves To M					
		HRAC Group F2 / (WSSA Group 28)	0 / (4)	0 / (4)	L / (20)	K 3 / (15)	F 1 / (12)	C 1 / (5)			
Cranberry	1	Callisto Post emergence at 8.0 fl. oz/A Plus Adjuvant*	2,4-D	Clopyralid	Dichlobenil	Napropamide	Norflurazon	Simazine	Count of AI Controlling Species. S, PC, Est., or Resistance not included.		
Common Name	Scientific Name	Apply to weeds <5"									
Weeds Controlled	With Postemergence Applicat										
Amaranth, palmer Amaranth, Powell	Amaranthus palmeri	C	18-17		1.65	1000	8143		0		
Amaranth, spiny	Amaranthus powellii Amaranthus spinosus	C C			- alle		122619		0		
Atriplex	Chenopodium orach	č	-					S. Contraction	0		
Broadleaf signalgrass	Brachiaria platphylla						Sec. 1	LEASE S	0		
Buckwheat, wild	Polygonum convolvulus	PC		197			-	-			
Buffalobur	Solanum rostratium	C C	100		100				0		_
Burcucumber	Sicyos angulatus	PC			1999.87	N. Frank		at the	0		
Carpetweed Carrot, wild	Mollugo verticillata	C C			and a	-25		1.12	0		
Chickweed, common	Daucus carota Stellaria media	C C	- Alerta	Cale C					0		
Cocklebur, common	Xanthium strumarium	- C	1200		-						
Crabgrass, large	Digitaria sanguinalis	C <sup>1</sup>	1.57.64	11-11		121	-	-	0		
Dock, curly	Rumex crispus	PC	25121		11/102	20.2	1000		0		
Galinsoga	Galinsoga parviflora	C	1.22	196	S S COST	1582	100 1	Carlos and	0	+	
Hemp Horse nettle	Cannabis sativa	C	1159	10.00	and the				0		
Horseweed/Marestail	Solanum carolinense Conyza canadensis	C PC		2153		103 - 1		2005	0		
Jimsonweed	Datura stramonium		1111				-		0		-
Knotweed, prostrate	Polygonum aviculare	PC	10.00	ALC: LANS		Sector Sector			0		
Kochia	Kochia scoparia	PC1	282	Control 1		E.C.		11111	0		
ambsquarters, common	Chenopodium album	C	1.200		121.14	10000	17.70		0		
Morningglory, entireleaf; ivyleaf	Ipomoea hederacea	PC	100	12-31	The set	1.52	1013	1	ő		-
Morningglory, pitted	Ipomoea lacunosa	PC	10.5	1010	14.554	10993	1200	RUSAC	0		1000
Mustard, wild Nightshade, black	Brassica kaber	C		17Y(1)		F) 49.	1000	1.30	0		
Nightshade, eastern black	Solanum nigrum Solanum ptycanthum	c			10.25				0		
lightshade, hairy	Solanum sarrachoides	C C	-	-	199			22.03	0		
lutsedge, yellow	Cyperus esculentus	PC		-			100		0		
Pigweed, redroot	Amaranthus retroflexus	c						1223	0		
	Amaranthus hybridus	C	100	110		200			0		
	Amaranthus albus	C		100	245		1000	2646	0		
	Phytolacca americana Solanum spp.	PC C			1000			01.275	0		
usley, Florida	Richardia scabra			100		-	-	-	0		
Ragweed, common	Ambrosia artemisiifolia	PC	c	c					2		
	Ambrosia trifida	C	Est	Est		Star La Ca	2221	-	0		
esbania, hemp martweed, ladysthumb	Sesbania exaltata	C		19.64	120				0		_
	Polygonum persicaria	C			180 1			128.3	0		
	Polygonum lapathifolium	C	A. 16	16.8	15145			-	0	-	
	Polygonum pensylvanicum	С					1		0		
unflower, common elvetieaf	Helianthus annuus Abutilon theophrasti	C							0		
/aterhemp, common	Abutilon theophrasti Amaranthus rudis	C C		-					0		
	Amaranthus tuberculatus	c				-		-	0		
	Hypericum boreala	c		-	-	-		-	0		
	Juncus spp.		1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	С			-	1		
	Carex spp.	c		-			Est		0		
	Lysimachia terrestris	C				-			0		
			Est	the second second				Terrai	0		1957 - S
lverleaf //	Potentilla pacifica	C						the second se	0		

Weeds Controlled Wit	th Preemergence Applications of	Callisto	2,4-D	Clopyralid	Dichlobenil	Napropamide	Norflurazon	Simazine	Count of Al Controlfing Species. S, PC, Est., or		
Common Name	Scientific Name	8.0 fl. oz./A					-				
Amaranth, palmer	Amaranthus palmeri	C	1000	100000	1	100.00	COLORADO S	Est	0		+
Amarath, Powell	Amaranthus powellii	C	12000	1	10000		-	Est	0		
Amaranth, spiny	Amaranthus spinosus	C			1.0	1.000		Est	0		-
Broadleaf signalgrass	Brachiaria platyphylla	C <sup>1</sup>				-	-	C			
Buffalobur	Solanum rostratum	C	1000	Party Party	Concer - C. al	a strand over	-				-i
Carpetweed	Mollugo verticillata	č		-	C	C		C	0		
Chickweed, common	Stellaria media	č		-	t č	tč	+	1 6	3		
Cocklebur, common	Xanthium strumarium	PC	100	1000		10	1	10			
Crabgrass, large	Digitaria sanguinalis	C <sup>1</sup>		1	C	C	-				
Galinsoga	Galinsoga parviflora	č	1.5.110	CONTRACTOR OF	1	10		C	3		-
limsonweed	Datura stramonium	č						-	0		
Kochia	Kochia scoparia	PC	The state	1	-	10000	-		0		
ambsquarters, common	Chenopodium album	c	STREET,	1			State and				
lorningglory, entireleaf; ivy	Ipomoea hederacea	PC	1.2.5	-	C	C	-	C	2		
forningglory, pitted	Ipomoea lacunosa		18.00	-	14 (D) (E)	The second	-	Est	0	-	
lightshade, eastern black	Solanum ptycanthum	PC	1	-	12.00	2000	0.0	Est	0		
lightshade, hairv	Solanum sarrachoides	C C	-	-		-	Les in	Est	0		
Pigweed, redroot	Amaranthus retroflexus	č			C		1000	Est	0		-
Plaweed, smooth	Amaranthus hybridus	č			U.	C		Est	2		
Pigweed, tumble	Amaranthus albus	l č l			Con Links		Sec. 1	Est	0		-
Ragweed, common	Ambrosia artemisiifolia	č		C	C	PC	0.00	Est	0		-
Ragweed, giant	Ambrosia trifida	PC	100	Est	Est	FU	-	Est	2		-
martweed, ladysthumb	Polygonum persicaria	c	19971	LOL	Lot	1	100 1000				
imartweed, pale	Polygonum lapathifolium	č	10000	-	1	-	100	Est	0		
martweed, Pennsylvania	Polygonum pensylvanicum	c		-	С	_	-	Est	0		
unflower, common	Helianthus annuus	c		1	U.			C	1		
elvetleaf	Abutilon theophrasti	č			-	-	-		0		
Vaterhemp, common	Amaranthus rudis	č	-	-	-		-	Est	0		
Vaterhemp, tall	Amaranthus tuberculatus	c						Est			
ount of Spp. Combined		63	1						0		
Criteria 1: Insufficient Efficat	cious Alternative to Mesotrione	03	Yes	2 Yes	8	5	0	4			
	Resistant biotypes per chemical	alone that and			Yes	Yes	Yes	Yes			
	controlled by mesotrione. A "C" that weed has resistant biotypes controlled by that product.	within a pink sha	aded c	ell indica	ites						

				( incoming			
Characteristic	Mesotrione Reduced Risk Al	2' <b>4</b> -D	Clopyralid	linėdoldoiC	abimeqorqsV	งดาปีมาระวงก	ənizsmić
	100-1131	71368-1	62719-73	400-168	70506-36	5481-506	100-526
Reduced Risk by EPA	Yes	No	No	No	No	No	No
Label Signal Word	Caution	Danger	Caution	Caution	Caution	Caution	Caution
Gene Toxicity	Negative	Negative	Negative	Negative	Negative	Negative	Negative
Teratogenicity	Negative	Negative	Negative	Positive	Negative	Negative	Negative
Reproductive Toxicity	Negative	Negative	Negative	Negative	Negative	Negative	Negative
Carcinogenic Potential	Not Likely	D	Not Likely	o	ω	, co	Not likely
Acute Neurotoxicity	Negative	Positive	ON	QN	Q	Negative	GN
Subchronic/Chronic Neurotoxicity	Negative	Positive	QN	Q	Q	QN	
REI in Hours*	12	48	12	12	12	12	12
PHI in Days*	After bud break	Ę	50	NL	NL	Z	N
*PPE*	Chem resist gloves	3	2	2		! c	-
Applic. Method (Pre)	Pre	NL	NL	Pre	Pre	Pre	Dro
Pre Ibs ai./A	0.25	NL	N	4.0	40-150	4 0-8 0	OFUC
Applic. Method (Post)	Post	Wipe	Yes	Z	IN	IN	0.4-0.2
Post Ibs ai./A	0.25	33%	0.063-0.188	N			
No. Applic. / year	2	1	2			- <u>-</u>	, L
Max. Al Ibs./yr	0.5	Not specified	0.375	4.0	15.0	08	2 2
US or Regional label	US	RI - MA	RI - WI	SI I	010	0.0	0.4
**Environmental Hazard	Surface Water Advisory runoff	3			3 4	3	ß
Criterion II: Alterntive			1	-	>	2	
Foses Greater Human or Environmental Risk		Yes	Yes	Yes	Yes	Yes	Yes
oxadiazon, pelargonic acid, and sethoxydim. Refer to Attachment "Active Ingredients Within The Analyses Across Crops That Are Not Considered Viable Alternatives To Mesotrione".	id, and sethoxydim. Re	fer to Attachment ' Viable Alter	ttachment "Active Ingredients Withi Viable Alternatives To Mesotrione".	ts Within The Autrione".	nalyses Across Cr	ops That Are No	t Considered
"KEI = Restricted Entry Interval. PHI = Pre Harvest Interval. PPE = Personal Protective Equipment.	rval. PHI = Pre Harvest	Interval. PPE = F	Personal Protectiv	re Equipment.			

Characteristic	Mesolione Aist	2'4-D	Clopyralid	linədoldoiC	Japropamide	יסרוטראבסח	ənizsmið
EPA. Reg. No.	100-1131	7	62719-73	400-168	70506-36	5481-506	100-526
HRAC / WSSA Classification of Active Ingredient Chemistry Class by Mode of							
O Mood C	F 2/(28)*	0/(4)	0/(4)	L / (20)	K3/ (15)	F1/(12)	C1 / (5)
Resistant Biotypes Per Chemistry Class in US	0	ø	Ø	C			3
No. of Biotypes Controlled or Partially Controlled by					-	-	3
Mesotrione	9 Jaho ka 1999 - 1999 - 1999	2	2	0	0	0	14
Criterion III: Mesotrione will play role in managing Pest Resistance to this Active		Yes	Yes	No	No	No	Yes
Criterion III: Mesotrione will play a role in managing pest resistance in Cranberries	YES						

Cranberries T	able 4: Mes		FIFRA Section 3(	c)(1)(F)(ii) Criteria I, II,
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			n ny provensi ang kanala k
2, 4 - D	No	Yes	Yes	Yes
Clopyralid	No	Yes	Yes	Yes
Dichlobenil	No	Yes	Yes	No
Napropamide	No	Yes	Yes	No
Norflurazon	No	Yes	Yes	No
Simazine	No	Yes	Yes	Yes
*Combined evalua	tion of human	safety, application	rate, and environmenta	al impact.

#### **Grasses Grown For Seed: Perennial Ryegrass**

US perennial ryegrass grown for seed is estimated to be 193,000 acres by Extension Weed Specialist at OR State University, qualifying it as a minor crop. Mesotrione was registered on perennial ryegrass 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 perennial ryegrass 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 and select grasses. 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 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.

Perennial Ryegrass Grown For Seed: Mesotrione Meets FIFRA Section 3(c)(1)(F)(i	i)
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.