



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

AUG 19 1993

MEMORANDUM

OFFICE OF  
PREVENTION, PESTICIDES AND  
TOXIC SUBSTANCES

SUBJECT: Dietary Exposure Analysis for the Proposed Use of Thiameturon methyl (Harmony<sup>®</sup> PP#0F3961) and Tribenuron methyl (Express<sup>®</sup> PP#0F3962) on Oats.

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TO: Joanne Miller, PM 23  
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THROUGH: James P. Kariya, Section Head *JKariya*  
Dietary Risk Evaluation Section *JKariya*  
Health Effects Division

**Action Requested**

Provide a dietary exposure analysis for the proposed use of thiameturon methyl and tribenuron methyl on oat grain each with a tolerance of 0.05ppm. The two chemicals are to be marketed together in a product named Harmony<sup>®</sup> Extra. Thiameturon methyl is also known by the company designation DPX-M6316 as well as thifensulfuron methyl. Tribenuron methyl is also known by the company designation DPX-L5300.

**Discussion**

1. Toxicological Endpoint: The Dietary Risk Evaluation System (DRES) chronic analysis for thiameturon methyl used a Reference Dose (RfD) of 0.013 mg/kg body weight/day, based on a no observed effect level (NOEL) of 1.25 mg/kg bwt/day and an uncertainty factor of 100. The NOEL is taken from a two year feeding study in rats which demonstrated as an effect lower body weight gains in males. Serum sodium in males and females was sporadically lower throughout the study. This RfD has been approved by both the HED (2/25/88) and Agency (3/23/88) RfD committees.

The DRES chronic analysis for tribenuron methyl used a RfD of 0.008 mg/kg bwt/day, based on a NOEL of 0.79 mg/kg bwt/day and an uncertainty factor of 100. The NOEL is taken from a one year feeding study in dogs which demonstrated as an effect elevated serum bilirubin and AST levels. Tribenuron methyl is considered a class C carcinogen with no Q\* established for quantification of potency.

2. Residue Information: Food uses evaluated in this analysis for thiameturon methyl were the published tolerances (barley, soybeans and wheat) found in 40 CFR §180.439 and the Tolerance



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Index System (TIS) and a pending tolerance on corn. Food uses for tribenuron methyl were the published uses (barley and wheat) found in 40 CFR §180.451 and TIS. Currently there are no pending tolerances for tribenuron methyl.

CBTS is recommending for permanent tolerances for residues of thiameturon methyl on oat grain at 0.05 ppm and is not requiring tolerances for meat and milk at this time. Also, CBTS recommends for tolerances for tribenuron methyl on oat grain at 0.05 ppm without requiring meat or milk tolerances (R. Cook memo, 5/18/92 and M. Bradley memo, 7/19/93). Summaries of the residue values used are included as Table 1a and 1b.

### 3. Results:

**A. Thiameturon methyl:** A DRES chronic exposure analysis was performed for thiameturon methyl using tolerance level residues and 100 percent crop treated information to estimate the Theoretical Maximum Residue Contribution (TMRC) for the general population and 22 population subgroups. A summary of the TMRCs and their representations as a percentage of the RfD is attached as Table 2a.

The TMRC for the general population from all published tolerances is  $1.1 \times 10^{-4}$  mg/kg bwt/day, representing 1% of the RfD. The tolerances proposed for the oat grain contributes  $5 \times 10^{-6}$  mg/kg bwt/day, or < 1% of the RfD (viz. 0.03). If proposed new tolerances and the pending tolerance on corn are considered, the resulting TMRC would be  $1.3 \times 10^{-4}$  mg/kg bwt/day, representing 1% of the RfD.

The highest exposed subgroups are non-nursing infants (< 1 yr.) and children (1-6 yrs.). If the proposed tolerance is published and including the pending tolerance on corn, the TMRC for the non-nursing infants subgroup would be  $3.1 \times 10^{-4}$  mg/kg bwt/day, or 2% of the RfD. Considering the same situation, the subgroup for children would result in a TMRC of  $2.8 \times 10^{-4}$  mg/kg bwt/day, also 2% of the RfD.

**B. Tribenuron methyl:** A DRES chronic exposure analysis was performed for tribenuron methyl using tolerance level residues and 100 percent crop treated information to estimate the TMRC for the same subgroups as listed above. A summary of the TMRCs and their representations as a percentage of the RfD is attached as Table 2b.

The TMRC for the general population from all published tolerances is  $7.4 \times 10^{-5}$  mg/kg bwt/day, representing 1% of the RfD (viz. 0.92). The proposed tolerance on oats contributes an additional  $5.0 \times 10^{-6}$  mg/kg bwt/day, which represents < 1% of the RfD. If the new tolerance were published the total TMRC would equal  $7.8 \times 10^{-5}$  mg/kg bwt/day, or 1% of the RfD (viz. 0.97).

The highest exposed subgroups are children (1-6 yrs) and children (7-12 yrs). If the proposed tolerance on oats is published the resultant TMRC would be  $1.7 \times 10^{-4}$  mg/kg bwt/day, comprising 2% of the RfD for children (1-6 yrs). If the tolerance on oats is published the TMRC from all uses would be  $1.2 \times 10^{-4}$  mg/kg bwt/day for children (7-12 yrs), also 2% of the RfD.

DRES considers the dietary risk from thiameturon methyl and tribenuron methyl uses on oats to be of minimal concern. Also, considering that the proposed uses are given at tolerance level and 100% crop treated values there is likely overestimation of exposures. Exposure from residues for thiameturon methyl through oats represents < 1% of the RfD for the U.S. general population. Similarly, exposure from residues for tribenuron methyl through oats represents < 1% of the RfD for the U.S. population. Based on these values, it is safe to say that the chronic dietary risk for residues of thiameturon methyl and tribenuron methyl through the proposed use on oat grain is minimal.

Attachments

cc: DRES (Harmony & Express), Tox II, CBTS, Caswell #419S and 573S

Table Ia.

CHEMICAL INFORMATION FOR CASWELL NUMBER 5735

DATE: 08/13/93

PAGE: 1

FOOD CODE	FOOD NAME	STUDY TYPE	EFFECTS	REFERENCE DOSES			DATA GAPS/COMMENTS	STATUS
				ADI	UF	PUBLISHED		
Harmony (DPX-M6316) Caswell #5735 CAS No. 79277-27-3 A.I. CODE: 128845 CFR No. 180.439								
		2yr feeding - rat	Lower body wt gains in M, serum sodium in M & F were sporadically lower throughout the study. No evidence of oncogenicity in rats or mice.	OPp RfD= 0.013000 EPA RfD= 0.013000		No data gaps.	HED complete 02/25/88. EPA verified 03/23/88. On IRIS.	
		NOEL= 1.2500 mg/kg LEL= 25.0000 mg/kg 500.00 ppm						
		ONCO: Negative- 2 species.						
FOOD CODE	FOOD NAME	PETITION NUMBER	NEW	TOLERANCE (PPM)	PENDING	PUBLISHED		
15029AA	SOYBEANS-SPROUTED SEEDS	8F3663				0.100000		
24001AA	BARLEY	6F3431				0.050000		
24002EA	CORN, GRAIN-ENDOSPERM	0F3872		0.050000				
24002HA	CORN, GRAIN-BRAN	0F3872		0.050000				
24002SA	CORN SUGAR	0F3872		0.050000				
24003AA	OATS	0F3961	0.050000					
24007AA	WHEAT-ROUGH	6F3431				0.050000		
24007GA	WHEAT-GERM	6F3431				0.050000		
24007HA	WHEAT-BRAN	6F3431				0.050000		
24007MA	WHEAT-FLOUR	6F3431				0.050000		
270020A	CORN, GRAIN-OIL	0F3872						
27010DA	SOYBEANS-OIL	8F3663		0.050000		0.100000		
28023AA	SOYBEANS-UNSPECIFIED	8F3663				0.100000		
28023AB	SOYBEANS-MATURE, SEEDS DRY	8F3663				0.100000		
28023MA	SOYBEANS-FLOUR, FULL FAT	8F3663				0.100000		
28023MB	SOYBEANS-FLOUR, LOW FAT	8F3663				0.100000		
28023MC	SOYBEANS-FLOUR, DEFATTED	8F3663				0.100000		

Table 1b.

TOLERANCE ASSESSMENT SYSTEM ROUTINE CHRONIC ANALYSIS

DATE: 08/13/93

PAGE: 1

CHEMICAL INFORMATION	STUDY TYPE	EFFECTS	REFERENCE DOSES	DATA GAPS/COMMENTS	STATUS	EFFECT OF ANTICIPATED RESIDUES		
						ARC	%RFD	
Harmony (DPX-M6316) Cassell #573S CAS No. 79277-27-3 A.I. CODE: 128845 CFR No. 180.439	2yr feeding- rat NOEL= 1,2500 mg/kg 25.00 ppm LEL= 25.0000 mg/kg 500.00 ppm ONCO: Negative- 2 species.	Lower body wt gains in M, serum sodium in M & F were sporadically lower throughout the study. No evidence of oncogenicity in rats or mice.	ADI UF -->100 QPP RfD= 0.013000 EPA RfD= 0.013000	No data gaps.	HED complete 02/25/88. EPA verified 03/23/88. On IRIS.			
POPULATION SUBGROUP			TOTAL TMRC (MG/KG BODY WEIGHT/DAY)					
U.S. POPULATION - 48 STATES			CURRENT TMRC*	NEW TMRC**	NEW TMRC AS PERCENT OF RFD	DIFFERENCE AS PERCENT OF RFD		
U.S. POPULATION - SPRING SEASON			0.000107	0.000128	0.986331	0.160200		
U.S. POPULATION - SUMMER SEASON			0.000104	0.000124	0.953808	0.150738		
U.S. POPULATION - FALL SEASON			0.000106	0.000126	0.972469	0.160915		
U.S. POPULATION - WINTER SEASON			0.000111	0.000132	1.016723	0.165723		
NORTHEAST REGION			0.000109	0.000130	1.002392	0.163462		
NORTH CENTRAL REGION			0.000108	0.000124	0.956108	0.122746		
SOUTHERN REGION			0.000110	0.000130	1.000338	0.151731		
WESTERN REGION			0.000103	0.000127	0.976862	0.181531		
HISPANICS			0.000109	0.000133	1.023138	0.186208		
NON-HISPANIC WHITES			0.000106	0.000140	1.074592	0.262577		
NON-HISPANIC BLACKS			0.000109	0.000128	0.987631	0.145946		
NON-HISPANIC OTHERS			0.000096	0.000122	0.942162	0.205785		
NURSING INFANTS (< 1 YEAR OLD)			0.000103	0.000121	0.933769	0.142885		
NON-NURSING INFANTS (< 1 YEAR OLD)			0.000064	0.000099	0.760692	0.270823		
FEMALES (13+ YEARS, PREGNANT)			0.000222	0.000308	2.368923	0.663923		
FEMALES 13+ YEARS, NURSING			0.000074	0.000088	0.673377	0.102069		
CHILDREN (1-6 YEARS OLD)			0.000095	0.000108	0.833492	0.100908		
CHILDREN (7-12 YEARS OLD)			0.000222	0.000280	2.153238	0.446215		
MALES (13-19 YEARS OLD)			0.000165	0.000203	1.564623	0.298123		
FEMALES (13-19 YEARS OLD, NOT PREG. OR NURSING)			0.000120	0.000142	1.089777	0.170231		
MALES (20 YEARS AND OLDER)			0.000093	0.000111	0.852100	0.136346		
FEMALES (20 YEARS AND OLDER, NOT PREG. OR NURS)			0.000090	0.000103	0.790315	0.094646		
			0.000072	0.000083	0.636608	0.082785		

\*Current TMRC does not include new or pending tolerances.  
\*\*New TMRC includes new, pending, and published tolerances.

TOLERANCE ASSESSMENT SUMMARY FOR Harmony (DPX-M6316)  
CASWELL #573S

DATE: 08/13/93

ANALYSIS FOR POPULATION SUB-GROUP: U.S. POPULATION - 48 STATES

EXISTING TOLERANCES (PUBLISHED ONLY)		
RESULT IN A TMRC OF:	0.000108	MG/KG/DAY
THE EXISTING TMRC IS EQUIVALENT TO:	0.826	% OF THE ADI.
PROPOSED NEW TOLERANCES (CURRENT PETITION ONLY)		
RESULT IN A TMRC OF:	0.000005	MG/KG/DAY
THESE NEW TOLERANCES WILL OCCUPY:	0.032	% OF THE ADI.
IF THE NEW TOLERANCES (CURRENT PETITION ONLY)		
ARE APPROVED THE RESULTANT TMRC WILL BE:	0.000112	MG/KG/DAY
THE NEW TMRC WILL OCCUPY	0.858	% OF THE ADI.
OTHER PENDING TOLERANCES EXCLUDING THE		
CURRENT NEW PETITION HAVE A TMRC OF:	0.000017	MG/KG/DAY
THIS TMRC WILL OCCUPY	0.128	% OF THE ADI.
IF ALL PENDING TOLERANCES (INCLUDING THE		
CURRENT NEW PETITION) ARE GRANTED		
THE RESULTANT TMRC WILL BE:	0.000129	MG/KG/DAY
THE TOTAL TMRC WILL OCCUPY	0.986	% OF THE ADI.

ANALYSIS FOR POPULATION SUB-GROUP: NON-NURSING INFANTS (< 1 YEAR OLD)

EXISTING TOLERANCES (PUBLISHED ONLY)		
RESULT IN A TMRC OF:	0.000222	MG/KG/DAY
THE EXISTING TMRC IS EQUIVALENT TO:	1.705	% OF THE ADI.
PROPOSED NEW TOLERANCES (CURRENT PETITION ONLY)		
RESULT IN A TMRC OF:	0.000038	MG/KG/DAY
THESE NEW TOLERANCES WILL OCCUPY:	0.288	% OF THE ADI.
IF THE NEW TOLERANCES (CURRENT PETITION ONLY)		
ARE APPROVED THE RESULTANT TMRC WILL BE:	0.000260	MG/KG/DAY
THE NEW TMRC WILL OCCUPY	1.993	% OF THE ADI.
OTHER PENDING TOLERANCES EXCLUDING THE		
CURRENT NEW PETITION HAVE A TMRC OF:	0.000049	MG/KG/DAY
THIS TMRC WILL OCCUPY	0.376	% OF THE ADI.
IF ALL PENDING TOLERANCES (INCLUDING THE		
CURRENT NEW PETITION) ARE GRANTED		
THE RESULTANT TMRC WILL BE:	0.000308	MG/KG/DAY
THE TOTAL TMRC WILL OCCUPY	2.369	% OF THE ADI.

ANALYSIS FOR POPULATION SUB-GROUP: CHILDREN (1-6 YEARS OLD)

EXISTING TOLERANCES (PUBLISHED ONLY)		
RESULT IN A TMRC OF:	0.000222	MG/KG/DAY
THE EXISTING TMRC IS EQUIVALENT TO:	1.707	% OF THE ADI.
PROPOSED NEW TOLERANCES (CURRENT PETITION ONLY)		
RESULT IN A TMRC OF:	0.000015	MG/KG/DAY
THESE NEW TOLERANCES WILL OCCUPY:	0.113	% OF THE ADI.
IF THE NEW TOLERANCES (CURRENT PETITION ONLY)		
ARE APPROVED THE RESULTANT TMRC WILL BE:	0.000237	MG/KG/DAY
THE NEW TMRC WILL OCCUPY	1.820	% OF THE ADI.
OTHER PENDING TOLERANCES EXCLUDING THE		
CURRENT NEW PETITION HAVE A TMRC OF:	0.000044	MG/KG/DAY
THIS TMRC WILL OCCUPY	0.333	% OF THE ADI.
IF ALL PENDING TOLERANCES (INCLUDING THE		
CURRENT NEW PETITION) ARE GRANTED		
THE RESULTANT TMRC WILL BE:	0.000280	MG/KG/DAY
THE TOTAL TMRC WILL OCCUPY	2.153	% OF THE ADI.

Table 2a.

CHEMICAL INFORMATION FOR CASWELL NUMBER 419S

DATE: 08/13/93

PAGE: 1

CHEMICAL	STUDY TYPE	EFFECTS	REFERENCE DOSES		DATA GAPS/COMMENTS	STATUS
			ADI	UF		
Express (IN L5300) Caswell #419S CAS No. 101200-48-0 A.I. CODE: 128887 CFR No. 180.	1yr feeding - dog NOEL = 0.7900 mg/kg LEL = 8,1600 mg/kg 250.00 ppm ONCO: C (HED NOTE)	Elevated serum bilirubin and AST levels, increased urinary volume Evidence of oncogenicity in rats (f; mammary carcinoma); negative mice.	OPR Rfd= 0.008000 EPA Rfd= 0.008000	-->100	No data gaps.	HED complete 09/14/88. EPA verified 10/12/88. On IRIS.

FOOD CODE	FOOD NAME	PETITION NUMBER	NEW	TOLERANCE (PPM)	
				PENDING	PUBLISHED
24001AA	BARLEY	7F3540			0.050000
24003AA	OATS	0F3962		0.050000	
24007AA	WHEAT-ROUGH	7F3540			0.050000
24007GA	WHEAT-GERM	7F3540			0.050000
24007HA	WHEAT-BRAN	7F3540			0.050000
24007WA	WHEAT-FLOUR	7F3540			0.050000

Table 2b.

TOLERANCE ASSESSMENT SYSTEM ROUTINE CHRONIC ANALYSIS

DATE: 08/13/93

PAGE: 1

CHEMICAL INFORMATION	STUDY TYPE	EFFECTS	REFERENCE DOSES	DATA GAPS/COMMENTS	STATUS
Express (IN L5300) Caswell #4195 CAS No. 101200-48-0 A.I. CODE: 128887 CFR No. 180.	1yr feeding- dog MODEL= 0.7900 mg/kg 25.00 ppm LET= 8.1600 mg/kg 250.00 ppm ONCO: C (HED NOTE)	Elevated serum bilirubin and AST levels, increased urinary volume Evidence of oncogenicity in rats (F; mammary carcinoma); negative mice.	ADI UF -->100 OPP RfD= 0.008000 EPA RfD= 0.008000	No data gaps.	HED complete 09/14/88. EPA verified 10/12/88. On IRIS.
POPULATION SUBGROUP					
U.S. POPULATION - 48 STATES	0.000073	0.000078	0.969187	0.051612	
U.S. POPULATION - SPRING SEASON	0.000072	0.000075	0.937025	0.041937	
U.S. POPULATION - SUMMER SEASON	0.000072	0.000075	0.943175	0.048275	
U.S. POPULATION - FALL SEASON	0.000076	0.000080	1.000638	0.056213	
U.S. POPULATION - WINTER SEASON	0.000075	0.000080	0.995950	0.060038	
NORTHEAST REGION	0.000078	0.000082	1.020925	0.051162	
NORTH CENTRAL REGION	0.000076	0.000081	1.009538	0.057900	
SOUTHERN REGION	0.000069	0.000072	0.905825	0.041750	
WESTERN REGION	0.000071	0.000076	0.950187	0.060138	
HISPANICS	0.000070	0.000074	0.930212	0.054787	
NON-HISPANIC WHITES	0.000075	0.000079	0.991963	0.052575	
NON-HISPANIC BLACKS	0.000064	0.000068	0.845688	0.044538	
NON-HISPANIC OTHERS	0.000070	0.000074	0.923362	0.045400	
NURSING INFANTS (< 1 YEAR OLD)	0.000025	0.000044	0.551425	0.241788	
NON-NURSING INFANTS (< 1 YEAR OLD)	0.000059	0.000096	1.200263	0.468175	
FEMALES (13+ YEARS, PREGNANT)	0.000052	0.000053	0.664750	0.019700	
FEMALES 13+ YEARS, NURSING	0.000065	0.000068	0.851000	0.032900	
CHILDREN (1-6 YEARS OLD)	0.000158	0.000173	2.162650	0.183950	
CHILDREN (7-12 YEARS OLD)	0.000116	0.000123	1.539750	0.093163	
MALES (13-19 YEARS OLD)	0.000084	0.000087	1.090625	0.037362	
FEMALES (13-19 YEARS OLD, NOT PREG. OR NURSING)	0.000064	0.000066	0.822000	0.026750	
MALES (20 YEARS AND OLDER)	0.000063	0.000065	0.816075	0.023000	
FEMALES (20 YEARS AND OLDER, NOT PREG. OR NURS)	0.000048	0.000050	0.619725	0.020463	

\*Current TMRC does not include new or pending tolerances.  
\*\*New TMRC includes new, pending, and published tolerances.



TOLERANCE ASSESSMENT SUMMARY FOR Express (IN L5300)  
CASWELL #419S

DATE: 08/13/93

## ANALYSIS FOR POPULATION SUB-GROUP: U.S. POPULATION - 48 STATES

EXISTING TOLERANCES (PUBLISHED ONLY)  
 RESULT IN A TMRC OF: 0.000074 MG/KG/DAY  
 THE EXISTING TMRC IS EQUIVALENT TO: 0.918 % OF THE ADI.

PROPOSED NEW TOLERANCES (CURRENT PETITION ONLY)  
 RESULT IN A TMRC OF: 0.000005 MG/KG/DAY  
 THESE NEW TOLERANCES WILL OCCUPY: 0.052 % OF THE ADI.

IF THE NEW TOLERANCES (CURRENT PETITION ONLY)  
 ARE APPROVED THE RESULTANT TMRC WILL BE: 0.000078 MG/KG/DAY  
 THE NEW TMRC WILL OCCUPY 0.969 % OF THE ADI.

NO OTHER PENDING TOLERANCES ARE IN THE FILE

## ANALYSIS FOR POPULATION SUB-GROUP: CHILDREN (1-6 YEARS OLD)

EXISTING TOLERANCES (PUBLISHED ONLY)  
 RESULT IN A TMRC OF: 0.000159 MG/KG/DAY  
 THE EXISTING TMRC IS EQUIVALENT TO: 1.979 % OF THE ADI.

PROPOSED NEW TOLERANCES (CURRENT PETITION ONLY)  
 RESULT IN A TMRC OF: 0.000015 MG/KG/DAY  
 THESE NEW TOLERANCES WILL OCCUPY: 0.184 % OF THE ADI.

IF THE NEW TOLERANCES (CURRENT PETITION ONLY)  
 ARE APPROVED THE RESULTANT TMRC WILL BE: 0.000174 MG/KG/DAY  
 THE NEW TMRC WILL OCCUPY 2.163 % OF THE ADI.

NO OTHER PENDING TOLERANCES ARE IN THE FILE

## ANALYSIS FOR POPULATION SUB-GROUP: CHILDREN (7-12 YEARS OLD)

EXISTING TOLERANCES (PUBLISHED ONLY)  
 RESULT IN A TMRC OF: 0.000116 MG/KG/DAY  
 THE EXISTING TMRC IS EQUIVALENT TO: 1.447 % OF THE ADI.

PROPOSED NEW TOLERANCES (CURRENT PETITION ONLY)  
 RESULT IN A TMRC OF: 0.000008 MG/KG/DAY  
 THESE NEW TOLERANCES WILL OCCUPY: 0.093 % OF THE ADI.

IF THE NEW TOLERANCES (CURRENT PETITION ONLY)  
 ARE APPROVED THE RESULTANT TMRC WILL BE: 0.000124 MG/KG/DAY  
 THE NEW TMRC WILL OCCUPY 1.540 % OF THE ADI.

NO OTHER PENDING TOLERANCES ARE IN THE FILE



13544

032630

**Chemical:** Thifensulfuron methyl, *ThiBENURON Methyl*  
**PC Code:** 128845, 128887  
**HED File Code** 11000 Chemistry Reviews  
**Memo Date:** 08/19/93  
**File ID:** 00000000  
**Accession Number:** 412-02-0012

HED Records Reference Center  
04/02/2002