



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

**OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES**

MEMORANDUM

DATE: December 8, 2004

SUBJECT: **Fluazifop-p-butyl**. Revised Acute and Chronic Dietary Exposure Assessments for the Tolerance Reassessment Eligibility Decision (TRED).

PC Code: 122809
DP Barcode: D310695

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Executive Summary

Acute and chronic dietary risk assessments for fluazifop-p-butyl were conducted using the Dietary Exposure Evaluation Model DEEM-FCID™, Version 2.03, which uses food consumption data from the USDA's Continuing Surveys of Food Intakes by Individuals (CSFII) from 1994-1996 and 1998. The analyses were performed to support the tolerance reassessment eligibility decision (TRED).

Acute Dietary Exposure Results and Characterization

An acute dietary exposure analysis (including food and water) was performed in order to determine the acute exposure and risks which result from the registered uses of fluazifop-p-butyl. Tolerance level with a ratio adjustment for additional metabolites of concern, 100% crop treated (CT), and default processing factors were used in these assessments. A screening level point estimate was used to assess the dietary exposure and risks from residues in water. No refinements were included for the acute dietary exposure analysis; therefore this is considered to be a conservative assessment. Dietary risk estimates are provided for the only population subgroup with an acute dietary endpoint, females 13-49 years of age. This assessment concludes that for all supported registered commodities, the acute dietary risk estimates are below the Agency's level of concern (<100 %aPAD) for females 13-49 years of age (<2 % aPAD) at the 95th exposure percentile.

Chronic Dietary Exposure Results and Characterization

Chronic dietary exposure analyses were also performed in order to determine the chronic exposure and risks which result from the registered uses of fluazifop-p-butyl. Tolerance level with a ratio adjustment for additional metabolites of concern, percent crop treated estimates, and default processing factors were used in these assessments. A screening level point estimate was used to assess the dietary exposure and risks from residues in water. No additional refinements were included. Dietary risk estimates are provided for the U.S. population (total) and various population subgroups. This assessment also concludes that for all commodities, the chronic dietary risk estimates are below the Agency's level of concern (<100 %cPAD) for the U.S. population (30% cPAD) and all population subgroups. The most highly exposed population subgroup in the chronic dietary exposure analysis is all infants less than 1 year of age (95% cPAD) with water, carrot babyfood, and spinach babyfood as the largest contributors. This assessment is still considered to be fairly conservative since tolerance and screening level estimates were used.

Cancer Dietary Exposure Results and Characterization

Fluazifop-p-butyl is classified as a "not likely to be carcinogenic to humans;" therefore, no dietary assessment has been performed at this time.

I. Introduction

Dietary risk assessment incorporates both exposure and toxicity of a given pesticide. For acute and chronic assessments, the risk is expressed as a percentage of a maximum acceptable dose (i.e., the dose which HED has concluded will result in no unreasonable adverse health effects). This dose is referred to as the population adjusted dose (PAD). The PAD is equivalent to the Reference Dose (RfD) divided by the special FQPA Safety Factor.

For acute and non-cancer chronic exposures, HED is concerned when estimated dietary risk exceeds 100% of the PAD. References which discuss the acute and chronic risk assessments in more detail are available on the EPA/pesticides web site: "Available Information on Assessing Exposure from Pesticides, A User's Guide," 6/21/2000, web link: <http://www.epa.gov/fedrgstr/EPA-PEST/2000/July/Day-12/6061.pdf>; or see SOP 99.6 (8/20/99).

II. Residue Information

Fluazifop-p-butyl [(*R*)-2-(4-((5-(trifluoromethyl)-2-pyridinyl)oxy)phenoxy)propanoic acid, butyl ester] is a selective herbicide registered for use for postemergence control of perennial and annual grass weeds. Fluazifop-p-butyl is currently registered for food/feed use on asparagus, carrot, coffee, cotton, endive (escarole), garlic, macadamia nut, onion (bulb), pecan, pepper, rhubarb, soybean, stone fruit, sweet potato, and yam.

Fluazifop-p-butyl is the resolved isomer (R enantiomer) of fluazifop-butyl [(*R,S*)-2-(4-((5-(trifluoromethyl)-2-pyridinyl)oxy)phenoxy)propanoic acid, butyl ester]. The fluazifop-butyl isomers are List B chemicals. Fluazifop-butyl (PC code 122805) has been canceled and only fluazifop-p-butyl is being supported for reregistration.

Fluazifop-p-butyl Use

Fluazifop-p-butyl products are registered in the U.S. to Syngenta Crop Protection, Inc. under the trade names Fusilade®, Fusion®, and Typhoon®. Currently, the 0.086, 0.47, 1, 2, and 4 lb/gal emulsifiable concentrate (EC) formulations of fluazifop-p-butyl are registered for use on food/feed crops. The products are typically applied as postemergence foliar or soil applications using ground or aerial equipment; preplant, at-planting and/or postharvest applications (to the plant) are also registered for some crops.

Tolerances are established under 40 CFR §180.411(a)(1) and (c)(1) for residues of fluazifop-butyl and free and conjugated fluazifop, expressed as fluazifop, in/on cotton commodities, soybean commodities, tabasco pepper, and animal commodities, and under §180.411(a)(2) and (c)(2) for residues of fluazifop-p-butyl and free and conjugated fluazifop (R isomer), expressed as fluazifop, in/on asparagus, carrots, coffee, endive, macadamia nuts, onion (bulb), pecans, rhubarb, spinach, stone fruit, and sweet potatoes.

The nature of the residue in plants and livestock is not adequately understood; additional plant metabolism studies with a root crop and a leafy vegetable, as well as ruminant and poultry metabolism studies must be submitted. In a meeting on March 3, 2004, the Metabolism Assessment Review Committee (MARC) recommended that for tolerance expression (both plants and animals), risk assessment of livestock commodities, and drinking water, the residues of concern are parent and fluazifop-acid (free and conjugated) However, the MARC also recommended that for risk assessment, the residues of concern are parent, fluazifop-acid (free and conjugated), 5-trifluoromethyl-2-pyridone, and 2-(4-hydroxyphenoxy) propionic acid (free and conjugated). (DP Barcode: 298939, S. Kinard, 6/22/04).

Residue Data used for Acute, Chronic, and/or Cancer Assessments:

For acute dietary exposure assessment, tolerance level residues with a ratio adjustment for additional metabolites of concern, 100% crop treated (CT), and default processing factors were used; however, for chronic dietary exposure assessment, %CT estimates from BEAD (memo dated May 30, 2004 by A. Grube) were utilized. No further refinements were included.

To account for all additional metabolites of concern for non-cancer risk identified by the HED metabolism committee (parent, fluazifop-acid plus 5-trifluoromethyl-2-pyridone, and 2-(4-hydroxyphenoxy) propionic acid), data from the fluazifop carrot (MRID No. 00152494), celery (MRID No. 40693102), and soybean (MRID Nos. 41994701-41994703) metabolism studies were used to derive residue adjustment factors by dividing residues of the pyridone plus the propionic acid by residues of parent and fluazifop-acid. Adjustment factors ranged from 0.12x to 0.9x. These adjustment factors were applied to the tolerance level residues (parent plus fluazifop acid), to derive estimates of non-measured metabolite residues. The derived values and tolerance level residues were added together to reflect the total residue of concern (parent and fluazifop acid plus the pyridone plus the propionic acid). The ratios and estimates used in these assessments are listed in the tables below.

Table 1. Metabolite Ratios								
Residue	Carrot roots*		Celery stems		Celery leaves		Soybean	
	%TRR	ppm	%TRR	ppm	%TRR	ppm	%TRR	ppm
fluazifop plus fluazifop acid	33.75	0.0885	39.6	0.032	62.7	0.401	28	3.1
5-trifluoromethyl-2-pyridone	1.0	0.003	2.8	0.003	9.6	0.061	–	--
2-(4-hydroxyphenoxy) propionic acid	5.6	0.019	1.1	0.001	0.3	0.002	25.5	2.8

- $(0.003 + 0.019)/0.0885=0.25X$
- $(0.25X)(Tolerance)+Tolerance=AR$

Table 2. Residue Estimates Used in Dietary Analyses						
RAC	Food Forms	%CT (chronic only)	Processing Factors	Tolerance	Ratio	Adjusted Residue Value
Apricot	all except dried	100	1	0.05	0.9x ¹	0.095
	dried		6			
Asparagus	all	2.5	1	3.0	0.12x ²	3.36
Beef	all except dried	100	1	0.05	NA	0.05
	dried		1.92			
Carrot	all	25	1	2.0	0.25x ⁴	2.50
Cherry	all	5	1	0.05	0.9x	0.095
Chicken	all	100	1	0.05	NA	0.05
Coffee	all	100	1	0.10	0.9x	0.19
Cottonseed	all	2.5	1	0.20	0.9x	0.38
Egg	all	100	1	0.05	NA	0.05
Endive	all	100	1	6.0	0.16x ³	6.96
Goat	all	100	1	0.05	NA	0.05
Horsemeat	all	100	1	0.05	NA	0.05
Macadamia Nut	all	100	1	0.10	0.9x	0.19
Milk	all	100	1	0.05	NA	0.05
Nectarine	all	5	1	0.05	0.9x	0.095
Onion (bulb)	all except dried	20	1	0.50	0.25x	0.625
	dried		9			
Peach	all except dried	5	1	0.05	0.9x	0.095
	dried		7			
Pecan	all	100	1	0.05	0.9x	0.095
Pepper (non-bell)	all	100	1	1.0	0.12x	1.12
Plum	all except dried and juice	100	1	0.05	0.9x	0.095
	dried		5			
	Prune, juice		1.4			
Pork	all	100	1	0.05	NA	0.05
Poultry	all	100	1	0.05	NA	0.05

Rhubarb	all	100	1	0.50	0.12x	0.56
Sheep	all	100	1	0.05	NA	0.05
Soybean	all except oil	5	1	1.0	0.9x	1.9
Soybean, oil	oil	5	1	2.0	0.9x	3.8
Spinach	all	100	1	6.0	0.16x	6.96
Sweet potato	all	100	1	0.50	0.25x	0.625
Turkey	all	100	1	0.05	NA	0.05
Water	all direct and indirect sources	100	1	NA	NA	0.058
Yam	all	100	1	0.50	0.25x	0.625

- 1 Soybean metabolism study.
- 2 Celery metabolism study (stalks).
- 3 Celery metabolism study (leaves).
- 4 Carrot metabolism study (roots).

III DEEM-FCID™ Program and Consumption Information

Fluazifop-p-butyl acute and chronic dietary exposure assessments were conducted using the Dietary Exposure Evaluation Model software with the Food Commodity Intake Database (DEEM-FCID™, Version 2.03), which incorporates consumption data from USDA’s Continuing Surveys of Food Intakes by Individuals (CSFII), 1994-1996 and 1998. The 1994-96, 98 data are based on the reported consumption of more than 20,000 individuals over two non-consecutive survey days. Foods “as consumed” (e.g., apple pie) are linked to EPA-defined food commodities (e.g. apples, peeled fruit - cooked; fresh or N/S; baked; or wheat flour - cooked; fresh or N/S, baked) using publicly available recipe translation files developed jointly by USDA/ARS and EPA. For chronic exposure assessment, consumption data are averaged for the entire U.S. population and within population subgroups, but for acute exposure assessment are retained as individual consumption events. Based on analysis of the 1994-96, 98 CSFII consumption data, which took into account dietary patterns and survey respondents, HED concluded that it is most appropriate to report risk for the following population subgroups: the general U.S. population, all infants (<1 year old), children 1-2, children 3-5, children 6-12, youth 13-19, adults 20-49, females 13-49, and adults 50+ years old.

For chronic dietary exposure assessment, an estimate of the residue level in each food or food-form (e.g., orange or orange juice) on the food commodity residue list is multiplied by the average daily consumption estimate for that food/food form to produce a residue intake estimate. The resulting residue intake estimate for each food/food form is summed with the residue intake estimates for all other food/food forms on the commodity residue list to arrive at the total average estimated exposure. Exposure is expressed in mg/kg body weight/day and as a percent of the cPAD. This procedure is performed for each population subgroup.

For acute exposure assessments, individual one-day food consumption data are used on an individual-by-individual basis. The reported consumption amounts of each food item can be multiplied by a residue point estimate and summed to obtain a total daily pesticide exposure for a deterministic exposure assessment, or “matched” in multiple random pairings with residue values and then summed in a probabilistic assessment. The resulting distribution of exposures is expressed as a percentage of the aPAD on both a user (i.e., only those who reported eating relevant commodities/food forms) and a per-capita (i.e., those who reported eating the relevant commodities as well as those who did not) basis. In accordance with HED policy, per capita exposure and risk are reported for all tiers of analysis. However, for tiers 1 and 2, any significant differences in user vs. per capita exposure and risk are specifically identified and noted in the risk assessment.

IV. Toxicological Information

On May 6, 2004, the Health Effects Division (HED) Hazard Identification Assessment Review Committee (HIARC) reviewed the recommendations of the toxicology reviewer for Fluazifop-butyl and Fluazifop-p-butyl with regard to the acute and chronic Reference Doses (RfDs) and the toxicological endpoint selection for use as appropriate in occupational/residential exposure risk assessments. The potential for increased susceptibility of infants and children from exposure to Fluazifop-butyl and Fluazifop-p-butyl was also evaluated as required by the Food Quality Protection Act (FQPA) of 1996 (TXR NO. 0052611; memo dated June 15, 2004 by D. Anderson). The conclusions drawn at this meeting are presented in Table 3 below.

Table 3. Summary of Toxicological Doses and Endpoints for Fluazifop-p-butyl for Use in Dietary Exposure Assessment			
Exposure Scenario	Dose Used in Risk Assessment, UF	Hazard and Exposure Based Special FQPA Safety Factor	Study and Toxicological Effects
Acute Dietary (General population including infants and children)	An appropriate endpoint attributable to a single dose was not identified in the available studies including the developmental toxicity studies.		
Acute Dietary (Females 13-49 years of age)	NOAEL = 50 mg/kg/day UF = 100 Acute RfD = 0.50 mg/kg	FQPA SF = 1X aPAD = $\frac{\text{acute RfD}}{\text{FQPA SF}}$ = 0.50 mg/kg/day	Developmental Toxicity in rats. LOAEL = 200 mg/kg/day based on diaphragmatic hernia.
Chronic Dietary (All populations)	NOAEL = 0.74 mg/kg/day UF = 100 Chronic RfD = 0.0074 mg/kg/day	FQPA SF = 1X cPAD = $\frac{\text{chronic RfD}}{\text{FQPA SF}}$ = 0.0074 mg/kg/day	Two-Generation Reproduction in rats. LOAEL = 5.8 mg/kg/day in males and 7.1 in females based on decreased spleen, testes & epididymal weights in males and uterine & pituitary weights in females.
Cancer	"Not likely to be carcinogenic to humans."		

V. Results/Discussion

As stated above, for acute and chronic assessments, HED is concerned when dietary risk exceeds 100% of the PAD. The DEEM-FCID™ analyses estimate the dietary exposure of the U.S. population and various population subgroups. The results reported in Table 4 are for the general U.S. Population, all infants (<1 year old), children 1-2, children 3-5, children 6-12, youth 13-19, females 13-49, adults 20-49, and adults 50+ years.

Results of Acute Dietary Exposure Analysis

An acute dietary exposure analysis (including food and water) was performed in order to determine the acute exposure and risks which result from the registered uses of fluazifop-p-butyl. Dietary risk estimates are provided for the population subgroup of females 13-49 years of age. This assessment is considered to be conservative. The results are listed below in Table 4.

Results of Chronic Dietary Exposure Analysis

Chronic dietary exposure analyses were also performed in order to determine the chronic exposure and risks which result from the registered uses of fluazifop-p-butyl. Dietary risk estimates are provided for the U.S. population (total) and various population subgroups. The most highly exposed population subgroup in the chronic dietary exposure analysis is all infants less than 1 year of age (95% cPAD) with water, carrot babyfood, and spinach babyfood as the largest contributors. This assessment is still considered to be fairly conservative since tolerance and screening level estimates were used. Results for all populations considered are listed below in Table 4.

Population Subgroup*	Acute Dietary (95 th Percentile)		Chronic Dietary		Cancer	
	Dietary Exposure (mg/kg/day)	% aPAD*	Dietary Exposure (mg/kg/day)	% cPAD*	Dietary Exposure (mg/kg/day)	Risk
General U.S. Population	NA	NA	0.002244	30.3	N/A	N/A
All Infants (< 1 year old)			0.007010	94.7		
Children 1-2 years old			0.005130	69.3		
Children 3-5 years old			0.003915	52.9		
Children 6-12 years old			0.002531	34.2		
Youth 13-19 years old			0.001589	21.5		
Adults 20-49 years old			0.001917	25.9		
Adults 50+ years old			0.002025	27.4		
Females 13-49 years old	0.008193	1.6	0.001918	25.9		

* Report %PADs to 2 significant figures.

Note. The values for the highest exposed population for each type of risk assessment should be bolded.

VI. Characterization of Inputs/Outputs

These assessments are considered to be conservative since they assumed tolerance level residues with the ratio adjustment accounting for the additional metabolites of concern and 100%CT for most commodities, and default processing factors. These assessments do not need to be further refined at this time; however, they could be further refined by using field trial or monitoring data and/or processing/or preparation/cooking data to refine the default processing factors.

VII. Conclusions

Conservative acute and chronic dietary exposure analyses (including food and water) were performed in order to determine the exposure and risks resulting from the registered uses of fluazifop-p-butyl. Tolerance level values with a ratio adjustment for additional metabolites of concern, default processing factors, and screening level point estimates for residues in water were used in these assessments. No %CT refinements were included for the acute dietary exposure analysis; however, %CT refinements were used for the chronic analysis. This assessment concludes that for all supported registered commodities, the acute dietary risk estimates are below the Agency's level of concern (<100 %aPAD) for females 13-49 years of age (<2 % aPAD) at the 95th exposure percentile. Chronic dietary risk estimates are provided for the U.S. population (total) and various population subgroups. The chronic assessment concludes that for all supported commodities, the chronic dietary risk estimates are below the Agency's level of concern (<100 %cPAD) for the U.S. population (30% cPAD) and all population subgroups. The most highly exposed population subgroup in the chronic dietary exposure analysis is all infants less than 1 year of age (95% cPAD) with water, carrot babyfood, and spinach babyfood as the largest contributors..

VIII. List of Attachments

- Acute and Chronic Food plus Water Residue Input file.
- Percent Crop Treated Memo from BEAD.
- Acute and DWLOC Results file.
- Chronic Results file.
- Critical Commodity Contribution Analysis for All infants (< 1 year).
- Critical Commodity Contribution Analysis for Non-nursing infants.

cc: S. Kinard (Residue Chemist, RRB2), K. Dockter (Product Chemist, RRB2), D. Anderson (Toxicologist, RRB2), A. Nielsen (Branch Senior Scientist, RRB2).

Acute and Chronic Food plus Water Residue Input file

U.S. Environmental Protection Agency Ver. 2.02
 DEEM-FCID Acute analysis for FLUAZIFOP-P-BUTYL
 Residue file name: C:\My Files\Fluazifop-p-butyl\DEEM\Fluazifop Screening.R98
 Analysis Date 09-09-2004 Residue file dated: 09-02-2004/14:38:41/8
 Reference dose: aRfD = 0.5 mg/kg bw/day NOEL = 50 mg/kg bw/day

EPA Code	Crop Grp	Food Name	Def Res (ppm)	Adj.Factors #1	Adj.Factors #2	Comment
12000120	12	Apricot	0.095000	1.000	1.000	Ratio
		Full comment: Ratio from soybean metabolism.				
12000121	12	Apricot-babyfood	0.095000	1.000	1.000	Ratio
		Full comment: Ratio from soybean metabolism.				
12000130	12	Apricot, dried	0.095000	6.000	1.000	Ratio
		Full comment: Ratio from soybean metabolism.				
12000140	12	Apricot, juice	0.095000	1.000	1.000	Ratio
		Full comment: Ratio from soybean metabolism.				
12000141	12	Apricot, juice-babyfood	0.095000	1.000	1.000	Ratio
		Full comment: Ratio from soybean metabolism.				
95000190	O	Asparagus	3.360000	1.000	0.025	Ratio
		Full comment: Ratio from celery metabolism.				
21000440	M	Beef, meat	0.050000	1.000	1.000	
21000441	M	Beef, meat-babyfood	0.050000	1.000	1.000	
21000450	M	Beef, meat, dried	0.050000	1.920	1.000	
21000460	M	Beef, meat byproducts	0.050000	1.000	1.000	
21000461	M	Beef, meat byproducts-babyfood	0.050000	1.000	1.000	
21000470	M	Beef, fat	0.050000	1.000	1.000	
21000471	M	Beef, fat-babyfood	0.050000	1.000	1.000	
21000480	M	Beef, kidney	0.050000	1.000	1.000	
21000490	M	Beef, liver	0.050000	1.000	1.000	
21000491	M	Beef, liver-babyfood	0.050000	1.000	1.000	
01010780	1AB	Carrot	2.260000	1.000	0.250	Ratio
		Full comment: Ratio from carrot metabolism.				
01010781	1AB	Carrot-babyfood	2.260000	1.000	0.250	Ratio
		Full comment: Ratio from carrot metabolism.				
01010790	1AB	Carrot, juice	2.260000	1.000	0.250	Ratio
		Full comment: Ratio from carrot metabolism.				
40000930	P	Chicken, meat	0.050000	1.000	1.000	
40000931	P	Chicken, meat-babyfood	0.050000	1.000	1.000	
40000940	P	Chicken, liver	0.050000	1.000	1.000	
40000950	P	Chicken, meat byproducts	0.050000	1.000	1.000	
40000951	P	Chicken, meat byproducts-babyfoo	0.050000	1.000	1.000	
40000960	P	Chicken, fat	0.050000	1.000	1.000	
40000961	P	Chicken, fat-babyfood	0.050000	1.000	1.000	
40000970	P	Chicken, skin	0.050000	1.000	1.000	
40000971	P	Chicken, skin-babyfood	0.050000	1.000	1.000	
95001150	O	Coffee, roasted bean	0.190000	1.000	1.000	Ratio
		Full comment: Ratio from soybean metabolism.				
95001160	O	Coffee, instant	0.190000	1.000	1.000	Ratio
		Full comment: Ratio from soybean metabolism.				
95001280	O	Cottonseed, oil	0.380000	1.000	0.025	Ratio
		Full comment: Ratio from soybean metabolism.				
95001281	O	Cottonseed, oil-babyfood	0.380000	1.000	0.025	Ratio
		Full comment: Ratio from soybean metabolism.				
70001450	P	Egg, whole	0.050000	1.000	1.000	
70001451	P	Egg, whole-babyfood	0.050000	1.000	1.000	

70001460	P	Egg, white	0.050000	1.000	1.000
70001461	P	Egg, white (solids)-babyfood	0.050000	1.000	1.000
70001470	P	Egg, yolk	0.050000	1.000	1.000
70001471	P	Egg, yolk-babyfood	0.050000	1.000	1.000
04011500	4A	Endive	6.960000	1.000	1.000
23001690	M	Goat, meat	0.050000	1.000	1.000
23001700	M	Goat, meat byproducts	0.050000	1.000	1.000
23001710	M	Goat, fat	0.050000	1.000	1.000
23001720	M	Goat, kidney	0.050000	1.000	1.000
23001730	M	Goat, liver	0.050000	1.000	1.000
24001890	M	Horse, meat	0.050000	1.000	1.000
14002130	14	Macadamia nut	0.190000	1.000	1.000Ratio
		Full comment: Ratio from soybean metabolism.			
27002220	D	Milk, fat	0.050000	1.000	1.000
27002221	D	Milk, fat - baby food/infant for	0.050000	1.000	1.000
27012230	D	Milk, nonfat solids	0.050000	1.000	1.000
27012231	D	Milk, nonfat solids-baby food/in	0.050000	1.000	1.000
27022240	D	Milk, water	0.050000	1.000	1.000
27022241	D	Milk, water-babyfood/infant form	0.050000	1.000	1.000
27032251	D	Milk, sugar (lactose)-baby food/	0.050000	1.000	1.000
03002370	3	Onion, dry bulb	0.565000	1.000	0.200Ratio
		Full comment: Ratio from carrot metabolism.			
03002371	3	Onion, dry bulb-babyfood	0.565000	1.000	0.200Ratio
		Full comment: Ratio from carrot metabolism.			
03002380	3	Onion, dry bulb, dried	0.565000	9.000	0.200Ratio
		Full comment: Ratio from carrot metabolism.			
03002381	3	Onion, dry bulb, dried-babyfood	0.565000	9.000	0.200Ratio
		Full comment: Ratio from carrot metabolism.			
12002600	12	Peach	0.095000	1.000	0.050Ratio
		Full comment: Ratio from soybean metabolism.			
12002601	12	Peach-babyfood	0.095000	1.000	0.050Ratio
		Full comment: Ratio from soybean metabolism.			
12002610	12	Peach, dried	0.095000	1.000	0.050Ratio
		Full comment: Ratio from soybean metabolism.			
12002611	12	Peach, dried-babyfood	0.095000	1.000	0.050Ratio
		Full comment: Ratio from soybean metabolism.			
12002620	12	Peach, juice	0.095000	1.000	0.050Ratio
		Full comment: Ratio from soybean metabolism.			
12002621	12	Peach, juice-babyfood	0.095000	1.000	0.050Ratio
		Full comment: Ratio from soybean metabolism.			
14002690	14	Pecan	0.095000	1.000	1.000Ratio
		Full comment: Ratio from soybean metabolism.			
08002720	8	Pepper, nonbell	1.120000	1.000	1.000Ratio
		Full comment: Ratio from celery metabolism.			
08002721	8	Pepper, nonbell-babyfood	1.120000	1.000	1.000Ratio
		Full comment: Ratio from celery metabolism.			
08002730	8	Pepper, nonbell, dried	1.120000	1.000	1.000Ratio
		Full comment: Ratio from celery metabolism.			
12002850	12	Plum	0.095000	1.000	1.000Ratio
		Full comment: Ratio from soybean metabolism.			
12002851	12	Plum-babyfood	0.095000	1.000	1.000Ratio
		Full comment: Ratio from soybean metabolism.			
12002860	12	Plum, prune, fresh	0.095000	1.000	1.000Ratio
		Full comment: Ratio from soybean metabolism.			
12002861	12	Plum, prune, fresh-babyfood	0.095000	1.000	1.000Ratio
		Full comment: Ratio from soybean metabolism.			
12002870	12	Plum, prune, dried	0.095000	5.000	1.000Ratio
		Full comment: Ratio from soybean metabolism.			

12002871	12	Plum, prune, dried-babyfood	0.095000	5.000	1.000	Ratio
		Full comment: Ratio from soybean metabolism.				
12002880	12	Plum, prune, juice	0.095000	1.400	1.000	Ratio
		Full comment: Ratio from soybean metabolism.				
12002881	12	Plum, prune, juice-babyfood	0.095000	1.400	1.000	Ratio
		Full comment: Ratio from soybean metabolism.				
25002900	M	Pork, meat	0.050000	1.000	1.000	
25002901	M	Pork, meat-babyfood	0.050000	1.000	1.000	
25002910	M	Pork, skin	0.050000	1.000	1.000	
25002920	M	Pork, meat byproducts	0.050000	1.000	1.000	
25002921	M	Pork, meat byproducts-babyfood	0.050000	1.000	1.000	
25002930	M	Pork, fat	0.050000	1.000	1.000	
25002931	M	Pork, fat-babyfood	0.050000	1.000	1.000	
25002940	M	Pork, kidney	0.050000	1.000	1.000	
25002950	M	Pork, liver	0.050000	1.000	1.000	
60003010	P	Poultry, other, meat	0.050000	1.000	1.000	
60003020	P	Poultry, other, liver	0.050000	1.000	1.000	
60003030	P	Poultry, other, meat byproducts	0.050000	1.000	1.000	
60003040	P	Poultry, other, fat	0.050000	1.000	1.000	
60003050	P	Poultry, other, skin	0.050000	1.000	1.000	
04023220	4B	Rhubarb	0.560000	1.000	1.000	Ratio
		Full comment: Ratio from celery metabolism.				
26003390	M	Sheep, meat	0.050000	1.000	1.000	
26003391	M	Sheep, meat-babyfood	0.050000	1.000	1.000	
26003400	M	Sheep, meat byproducts	0.050000	1.000	1.000	
26003410	M	Sheep, fat	0.050000	1.000	1.000	
26003411	M	Sheep, fat-babyfood	0.050000	1.000	1.000	
26003420	M	Sheep, kidney	0.050000	1.000	1.000	
26003430	M	Sheep, liver	0.050000	1.000	1.000	
06003470	6	Soybean, seed	1.900000	1.000	0.050	Ratio
		Full comment: Ratio from soybean metabolism.				
06003480	6	Soybean, flour	1.900000	1.000	0.050	Ratio
		Full comment: Ratio from soybean metabolism.				
06003481	6	Soybean, flour-babyfood	1.900000	1.000	0.050	Ratio
		Full comment: Ratio from soybean metabolism.				
06003490	6	Soybean, soy milk	1.900000	1.000	0.050	Ratio
		Full comment: Ratio from soybean metabolism.				
06003491	6	Soybean, soy milk-babyfood or in	1.900000	1.000	0.050	Ratio
		Full comment: Ratio from soybean metabolism.				
06003500	6	Soybean, oil	3.800000	1.000	0.050	Ratio
		Full comment: Ratio from soybean metabolism.				
06003501	6	Soybean, oil-babyfood	3.800000	1.000	0.050	Ratio
		Full comment: Ratio from soybean metabolism.				
04013550	4A	Spinach	6.960000	1.000	1.000	Ratio
		Full comment: Ratio from celery metabolism.				
04013551	4A	Spinach-babyfood	6.960000	1.000	1.000	Ratio
		Full comment: Ratio from celery metabolism.				
01033660	1CD	Sweet potato	0.565000	1.000	1.000	Ratio
		Full comment: Ratio from carrot metabolism.				
01033661	1CD	Sweet potato-babyfood	0.565000	1.000	1.000	Ratio
		Full comment: Ratio from carrot metabolism.				
50003820	P	Turkey, meat	0.050000	1.000	1.000	
50003821	P	Turkey, meat-babyfood	0.050000	1.000	1.000	
50003830	P	Turkey, liver	0.050000	1.000	1.000	
50003831	P	Turkey, liver-babyfood	0.050000	1.000	1.000	
50003840	P	Turkey, meat byproducts	0.050000	1.000	1.000	
50003841	P	Turkey, meat byproducts-babyfood	0.050000	1.000	1.000	
50003850	P	Turkey, fat	0.050000	1.000	1.000	

50003851	P	Turkey, fat-babyfood	0.050000	1.000	1.000
50003860	P	Turkey, skin	0.050000	1.000	1.000
50003861	P	Turkey, skin-babyfood	0.050000	1.000	1.000
86010000	O	Water, direct, all sources	0.058000	1.000	1.000
86020000	O	Water, indirect, all sources	0.058000	1.000	1.000

Percent Crop Treated Memo from BEAD

The tables below contain “screening level” usage data for agricultural crops. This information is retrieved from our principal agricultural pesticide usage databases. At the present time data from 1997 to 2001 is being used.

All numbers reported are rounded.

'<500' indicates less than 500 pounds of active ingredient.

'<2.5' indicates less than 2.5 percent of crop is treated.

'(CA only)' indicates information was available only for California. California requires reporting of all agricultural pesticide use. Their database may indicate small amounts of usage of a pesticide on crops on which the pesticide is not registered. Possible reasons for this include: This use may actually have occurred either as an unregistered use or as an experimental or other use in which the crop was not intended for consumption.

Data input errors may have occurred and either the crop or the pesticide is incorrect in the database.

Use of the chemical on crops for which only California use is reported may possibly have occurred in other states.

In some cases the percent crop treated column is blank. This is because information on acres grown was not readily available.

Arthur Grube 308-8095

SAS Friday, May 30, 2003 13:43 2

Screening Level Estimates of Agricultural Uses of Fluazifop-p-butyl
Sorted Alphabetically

OBS	Pounds of Active Crop	of Crop Ingredient	Percent Treated
1	Almonds (CA only)	<500	
2	Asparagus	<500	<2.5
3	Carrots	3,000	25
4	Cherries (CA only)	<500	
5	Cotton	30,000	<2.5
6	Garlic (CA only)	1,000	
7	Grapes (CA only)	<500	
8	Nectarines (CA only)	<500	
9	Onions	7,000	20
10	Peaches	1,000	5
11	Pears (CA only)	<500	
12	Pistachios (CA only)	<500	
13	Pomegranates (CA only)	<500	
14	Prunes & Plums (CA only)	<500	
15	Soybeans	200,000	5
16	Sugar Beets (CA only)	<500	
17	Sweet Potatoes (CA only)	<500	
18	Walnuts (CA only)	<500	
19	Watermelons	1,000	5

All numbers rounded. Acreage & %trted not available for all crops
'<500' indicates less than 500 pounds of active ingredient.
'<2.5' indicates less than 2.5 percent of crop is treated.
'(CA only)' indicates information was available only for California.
Use of Fluazifop-p-butyl may have occurred in other states.

(a002d7s.sas Fluazifop-p-butyl)

SAS Friday, May 30, 2003 13:43 3

Screening Level Estimates of Agricultural Uses of Fluazifop-p-butyl
Sorted by descending quantity of Fluazifop-p-butyl applied to each crop

OBS	Crop	Pounds of Active Ingredient	Percent of Crop Treated
1	Soybeans	200,000	5
2	Cotton	30,000	<2.5
3	Onions	7,000	20
4	Carrots	3,000	25
5	Peaches	1,000	5
6	Watermelons	1,000	5
7	Garlic (CA only)	1,000	
8	Asparagus	<500	<2.5
9	Almonds (CA only)		<500
10	Cherries (CA only)		<500
11	Grapes (CA only)	<500	
12	Nectarines (CA only)		<500
13	Pears (CA only)	<500	
14	Pistachios (CA only)		<500
15	Pomegranates (CA only)		<500
16	Prunes & Plums (CA only)	<500	
17	Sugar Beets (CA only)		<500
18	Sweet Potatoes (CA only)		<500
19	Walnuts (CA only)		<500

All numbers rounded. Acreage & %trted not available for all crops
'<500' indicates less than 500 pounds of active ingredient.
'<2.5' indicates less than 2.5 percent of crop is treated.
'(CA only)' indicates information was available only for California.
Use of Fluazifop-p-butyl may have occurred in other states.

(a002d7s.sas Fluazifop-p-butyl)

SAS Friday, May 30, 2003 13:43 4

Screening Level Estimates of Agricultural Uses of Fluazifop-p-butyl
Sorted by descending percent of crop treated with Fluazifop-p-butyl

OBS		Pounds of Active Crop	Percent of Crop Ingredient	Treated
1	Carrots	3,000	25	
2	Onions	7,000	20	
3	Soybeans		200,000	5
4	Peaches	1,000	5	
5	Watermelons	1,000	5	
6	Cotton	30,000	<2.5	
7	Asparagus	<500	<2.5	
8	Garlic (CA only)	1,000		
9	Almonds (CA only)		<500	
10	Cherries (CA only)		<500	
11	Grapes (CA only)	<500		
12	Nectarines (CA only)		<500	
13	Pears (CA only)	<500		
14	Pistachios (CA only)		<500	
15	Pomegranates (CA only)		<500	
16	Prunes & Plums (CA only)	<500		
17	Sugar Beets (CA only)		<500	
18	Sweet Potatoes (CA only)		<500	
19	Walnuts (CA only)		<500	

All numbers rounded. Acreage & %trted not available for all crops
'<500' indicates less than 500 pounds of active ingredient.
'<2.5' indicates less than 2.5 percent of crop is treated.
'(CA only)' indicates information was available only for California.
Use of Fluazifop-p-butyl may have occurred in other states.

(a002d7s.sas Fluazifop-p-butyl)
U.S. Environmental Protection Agency

Ver. 2.02

Acute and DWLOC Results file

U.S. Environmental Protection Agency Ver. 2.02
 DEEM-FCID ACUTE Analysis for FLUAZIFOP-P-BUTYL (1994-98 data)
 Residue file: 122809ac.R98 Adjustment factor #2 NOT used.
 Analysis Date: 12-06-2004/10:31:10 Residue file dated: 12-06-2004/10:27:32/8
 NOEL (Acute) = 50.000000 mg/kg body-wt/day
 Daily totals for food and foodform consumption used.
 Run Comment: ""

Summary calculations (per capita):

	95th Percentile			99th Percentile			99.9th Percentile		
	Exposure	% aRfD	MOE	Exposure	% aRfD	MOE	Exposure	% aRfD	MOE
Females 13+ (preg/not nursing):									
	0.009623	1.92	5195	0.016339	3.27	3060	0.016408	3.28	3047
Females 13+ (nursing):									
	0.016443	3.29	3040	0.018541	3.71	2696	0.018569	3.71	2692
Females 13-19 (not preg or nursing):									
	0.006837	1.37	7313	0.011150	2.23	4484	0.015074	3.01	3317
Females 20+ (not preg or nursing):									
	0.008051	1.61	6210	0.017278	3.46	2893	0.043147	8.63	1158
Females 13-50 yrs:									
	0.008174	1.63	6116	0.016244	3.25	3078	0.029448	5.89	1697
Females 13-49 yrs:									
	0.008193	1.64	6102	0.016275	3.26	3072	0.029388	5.88	1701

U.S. Environmental Protection Agency Ver. 2.02
 DEEM-FCID DWLOC Analysis for FLUAZIFOP-P-BUTYL (1994-98 data)
 Residue file: Fluazifop Screening.R98 Adjustment factor #2 NOT used.
 Analysis Date: 09-02-2004/14:45:41 Residue file dated: 09-02-2004/14:38:41/8
 EPA Acute Reference Dose (aRfD) = 0.500000 mg/kg body-wt/day
 Daily totals for food and foodform consumption used.
 Run Comment: ""

Summary calculations (per capita):

	95th Percentile ppm	99th Percentile ppm	99.9th Percentile ppm
Females 13-49 yrs:	19.108046	11.487003	6.027652

Chronic Results file

U.S. Environmental Protection Agency Ver. 2.00
 DEEM-FCID Chronic analysis for FLUAZIFOP-P-BUTYL (1994-98 data)
 Residue file name: C:\My Files\Fluazifop-p-butyl\DEEM\122809ac.R98
Adjustment factor #2 used.
 Analysis Date 12-06-2004/10:33:09 Residue file dated: 12-06-2004/10:27:32/8
 Reference dose (RfD, Chronic) = .0074 mg/kg bw/day

=====
 Total exposure by population subgroup

Population Subgroup	Total Exposure	
	mg/kg body wt/day	Percent of Rfd
U.S. Population (total)	0.002244	30.3%
U.S. Population (spring season)	0.002216	29.9%
U.S. Population (summer season)	0.002209	29.9%
U.S. Population (autumn season)	0.002250	30.4%
U.S. Population (winter season)	0.002302	31.1%
Northeast region	0.002225	30.1%
Midwest region	0.002191	29.6%
Southern region	0.002084	28.2%
Western region	0.002570	34.7%
Hispanics	0.002503	33.8%
Non-hispanic whites	0.002179	29.4%
Non-hispanic blacks	0.002133	28.8%
Non-hisp/non-white/non-black	0.003009	40.7%
All infants (< 1 year)	0.007010	94.7%
Nursing infants	0.002888	39.0%
Non-nursing infants	0.008574	115.9%
Children 1-6 yrs	0.004224	57.1%
Children 7-12 yrs	0.002385	32.2%
Females 13-19 (not preg or nursing)	0.001453	19.6%
Females 20+ (not preg or nursing)	0.002050	27.7%
Females 13-50 yrs	0.002014	27.2%
Females 13+ (preg/not nursing)	0.001975	26.7%
Females 13+ (nursing)	0.002890	39.1%
Males 13-19 yrs	0.001711	23.1%
Males 20+ yrs	0.001844	24.9%
Seniors 55+	0.002009	27.2%
Children 1-2 yrs	0.005130	69.3%
Children 3-5 yrs	0.003915	52.9%
Children 6-12 yrs	0.002531	34.2%
Youth 13-19 yrs	0.001589	21.5%
Adults 20-49 yrs	0.001917	25.9%
Adults 50+ yrs	0.002025	27.4%
Females 13-49 yrs	0.001918	25.9%

Critical Commodity Contribution Analysis for All infants (< 1 year)

U.S. Environmental Protection Agency Ver. 2.00
 DEEM-FCID Chronic analysis for FLUAZIFOP-P-BUTYL (1994-98 data)
 Residue file name: C:\My Files\Fluazifop-p-butyl\DEEM\122809ac.R98
Adjustment factor #2 used.
 Analysis Date 12-06-2004/10:33:13 Residue file dated: 12-06-2004/10:27:32/8
 Reference dose (RfD, Chronic) = .0074 mg/kg bw/day

=====
 Critical Commodity Contribution Analysis for
 All infants (< 1 year)

Total Exposure =.00701 mg/kg bw/day

Crop groups with total exposure contribution > 10%
 Foods/Foodforms with exposure contribution > 10%

Crop group Food Foodform	-----Exposure Analysis-----		
	mg/kg body wt/day	% of Total Exposure	Percent of RfD

Crop Group = (0) Other			
Water, indirect, all sources (86020000):			
FoodForm N/S	0.0034740	49.56%	46.95%

Total for crop group	0.0040085	57.18%	54.17%

Crop Group = (1) Root and Tuber Vegetables			
Total for crop group	0.0009616	13.72%	13.00%

Crop Group = (4) Leafy Vegetables (except Brassica)			
Spinach-babyfood (04013551):			
FoodForm N/S	0.0009079	12.95%	12.27%

Total for crop group	0.0010296	14.69%	13.91%

Crop Group = (4A) Leafy Greens			
Spinach-babyfood (04013551):			
FoodForm N/S	0.0009079	12.95%	12.27%

Total for crop group	0.0010296	14.69%	13.91%

Total for crop groups listed above:	0.0059997	85.59%	81.1%

Critical Commodity Contribution Analysis for Non-nursing infants

U.S. Environmental Protection Agency Ver. 2.00
 DEEM-FCID Chronic analysis for FLUAZIFOP-P-BUTYL (1994-98 data)
 Residue file name: C:\My Files\Fluazifop-p-butyl\DEEM\122809ac.R98
 Adjustment factor #2 used.
 Analysis Date 12-06-2004/10:33:13 Residue file dated: 12-06-2004/10:27:32/8
 Reference dose (RfD, Chronic) = .0074 mg/kg bw/day

=====
 Critical Commodity Contribution Analysis for
 Non-nursing infants

Total Exposure = .0085745 mg/kg bw/day

Crop groups with total exposure contribution > 10%
 Foods/Foodforms with exposure contribution > 10%

Crop group Food Foodform	-----Exposure Analysis-----		
	mg/kg body wt/day	% of Total Exposure	Percent of RfD

Crop Group = (0) Other			
Water, indirect, all sources (86020000):			
FoodForm N/S	0.0043582	50.83%	58.89%
-----	-----	-----	-----
Total for crop group	0.0049655	57.91%	67.10%
Crop Group = (1) Root and Tuber Vegetables			
Total for crop group	0.0010801	12.60%	14.60%
Crop Group = (4) Leafy Vegetables (except Brassica)			
Spinach-babyfood (04013551):			
FoodForm N/S	0.0011565	13.49%	15.63%
-----	-----	-----	-----
Total for crop group	0.0012578	14.67%	17.00%
Crop Group = (4A) Leafy Greens			
Spinach-babyfood (04013551):			
FoodForm N/S	0.0011565	13.49%	15.63%
-----	-----	-----	-----
Total for crop group	0.0012578	14.67%	17.00%
Total for crop groups listed above:	0.0073033	85.17%	98.7%
