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

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

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December 29, 2005

MEMORANDUM

SUBJECT: Section 18 Ecological Risk and Drinking Water Exposure Assessment for the Control of Soybean Rust Using Flutriafol (Impact ™ , 125SC)

FROM: Thuy Nguyen, Senior Scientist, ERB III
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THROUGH: Daniel Rieder, Branch Chief, ERB III
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TO: Daniel Rosenblatt, Risk Manager
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The EFED has reviewed the emergency exemption request from the Minnesota and South Dakota Departments of Agriculture to use Flutriafol for the control of Australasian soybean rust. This is the first section 18 request for this use. Flutriafol (Impact ™, 125SC), a product of Cheminova Inc, could be applied via ground or aerial spray at a rate of 0.91 oz a.i./A (0.0569 lb a.i./A) per application. A maximum of 2 applications is allowed per year with an assumed 7-day interval between application.

Please note that no Subdivision E, J and/or N Guideline studies were submitted with this request. Risk assessed and presented in this document was solely based on the non guideline studies submitted by the Registrant, Cheminova Inc. According to the fate and ecological effects data extracted from these non guidelines studies, EFED concludes that the proposed use of this fungicide to control soybean rust presents potential risks to non target birds and mammals, specifically Federally-listed endangered and threatened species. This assessment includes the following:

- summary of potential risks associated with the use of flutriafol (**Section I**); and
- water assessment for the use of flutriafol on soybean (**Section II**).

Although this risk assessment addresses the specific requests from Minnesota and South Dakota,

the analysis of exposure and potential risks in this report was approached from the perspective of a "national" new use assessment, except for estuarine/marine invertebrates. The assessment of potential ecological risks for flutriafol is based on the use rate, the numbers of application, and the interval between applications outlined in the Minnesota and South Dakota Section 18 request. Higher rates, more frequent applications, or different intervals for Section 18 requests to control soybean rust from other states, especially those associated with estuarine or marine habitant, are likely to change the conclusions concerning potential risks to terrestrial and aquatic non-target organisms that are outlined below.

I. SUMMARY OF RISKS

A summary of potential risks associated with flutriafol use to control soybean rust is provided below and in **Table I-1**. Note that no Subdivision E, J, and/or N Guideline studies were submitted for review in conjunction with this section 18 request, and risk presumed in this assessment was solely based on the non guideline studies submitted by the Registrant, Cheminova Inc.

The estimation of the Estimated Environmental Concentration (EEC) values for aquatic exposure are described in **section II**. Note that although this is a request for a Section 18 in Minnesota and South Dakota, the analysis of exposure was approached from the perspective of a "national" new use assessment, and the aquatic EECs were calculated using modeling scenarios simulated in areas with the highest soybean acreage and the highest level of runoff vulnerability: Georgia, Michigan, and Mississippi. The EEC values for terrestrial exposure were derived from the upper bound Kenaga exposure values of the Kenaga nomograph, which is based on a large set of actual field residue data and modified by Fletcher *et al*. (1994). These values represent how much pesticide residue might be expected on various types of plants and insects that may serve as food items for birds and mammals foraging in and about the vicinity of the treated areas . All EECs were calculated at the highest application rate of 0.0569 lbs ai/A, 2 applications, and a 7-day reapplication interval.

Table I-1 - Summary of risks for the use of Flutriafol to control rust on soybeans

	Acute Risk	Chronic Risk
Birds	RQ = 0.07 (1000g, short grass)*	No data. Cannot be assessed
Terrestrial Mammals	RQ = 0.06 (15g, short grass)* RQ = 0.05 (35g, short grass)*	No data. Cannot be assessed
Terrestrial Plants	No data. Cannot be assessed	No data. Cannot be assessed
Freshwater Organisms	No LOC exceedance	No LOC exceedance
Freshwater Plants - Vascular	No data. Cannot be assessed	No data. Cannot be assessed
Aquatic Plants - Vascular	No LOC exceedance	No data. Cannot be assessed

* Exceed Acute Endangered Species LOC of 0.05.

Note that no toxicity data were available from the Registrant's submission to assess risks to estuarine/marine invertebrates. Since this request is for Minnesota and South Dakota, the use of flutriafol on soybean may not enter the estuarine/marine environment and cause potential risk to the associated aquatic organism, and therefore the estuarine/marine tests could be waived for this request. However, these tests may be required if future Section 18s for flutriafol use on soybean are requested for states/use sites associated with estuarine or marine habitant.

Potential Risks from Flutriafol Exposure

Birds, Acute Exposure - Based on the upper bound exposure at an application rate of 0.0569 lbs a.i./Acre (2 applications, 7-day reapplication interval), the RQ was 0.07 (large birds, short grass food item), which exceeds the acute endangered species LOC of 0.05. EECs based on other food items or bird size classes did not result in LOC exceedances. A reduction in the maximum application rate from 0.0569 lbs a.i./Acre to 0.0375 lbs a.i./Acre would result in no acute avian LOC exceedance. Application rates of 0.04 lbs a.i./Acre and 0.0425 lbs a.i./Acre would not result in LOC exceedance if the re-application interval was 14 or 21 days, respectively. A single application at the maximum application rate of 0.0569 lb ai/A does not result in acute avian LOC exceedance.

EFED used the default foliar dissipation half-life of 35 days to estimate residue levels remaining from the first application at the time of the second application because no appropriate foliar dissipation half-life data were available for use in deriving EECs.

Note that there is no LOC exceedance when the EECs were calculated based on the mean Kenaga values.

Birds, Chronic Exposures - No chronic avian data were available for use in RQ calculations. Therefore chronic risks to bird cannot be assessed.

Terrestrial Mammals, Acute Exposures. Based on the highest proposed application rate for soybeans of 0.0569 lbs a.i./Acre (2 applications, 7-day reapplication interval), acute RQs are 0.06 and 0.05 for 15g and 35g herbivores, respectively , feeding on short grass. These RQs exceeds the acute endangered species LOC of 0.05. The RQs based on other food items, large herbivores, all insectivores, and all granivores were below the LOC. A reduction in the maximum application rate from 0.0569 lbs a.i./Acre to 0.0413 lbs a.i./Acre would result in no acute mammals LOC exceedances. Application rates of 0.0438 lbs a.i./Acre and 0.0465 lbs a.i./Acre would not result in LOC exceedances if the re-application interval was 14 or 21 days, respectively. Also, a single application at the maximum application rate of 0.0569 lb ai/Acre will reduce all RQs below the acute LOC.

Note that there is no LOC exceedance when the EECs were calculated based on the mean Kenaga values.

Terrestrial Mammals, Chronic Exposures. No chronic mammal data were available for use in RQ calculations. Therefore chronic risks to terrestrial mammals cannot be assessed.

Terrestrial Plants. No toxicity data were available for use in RQ calculations for terrestrial plants. Therefore risks to terrestrial plants cannot be assessed.

Aquatic Organisms, Acute Exposure. No acute LOCs were exceeded for freshwater organisms. Using the most sensitive toxicity endpoint among all freshwater organisms (LC_{50} of 890 ppb from freshwater invertebrates) and the highest peak aquatic exposure (EEC of 25 ppb from the GA Soybean scenario), no RQ exceeds the LOC. Therefore, it is expected that flutriafol at application rate proposed for this Emergency Exemption Use request does not pose acute risk to freshwater fish or invertebrates at the Agency's concern levels.

Aquatic Organisms, Chronic Exposure. No chronic LOCs were exceeded for freshwater organisms. The lowest reported NOAEC in these aquatic organisms was 310 ppb (daphnia). This value is approximately 10-fold higher than the highest peak aquatic EEC of 25 ppb (GA scenario). Therefore, it is expected that flutriafol at application rate proposed for this Emergency Exemption Use request does not pose chronic risk to fish or invertebrates at the Agency's concern levels.

Aquatic Plants. The lowest algal EC_{50} was 1900 ppb. This value is substantially higher than the highest peak aquatic EEC of 25 ppb (GA scenario), which indicates no acute risks to non vascular plants. Chronic toxicity data for non vascular plants and toxicity data for other aquatic plant species are not available in the sources used for this assessment, therefore associated risks could not be evaluated.

Co-Location of Endangered Species

A summary of the number of endangered species located (county level) where soybeans are produced is presented below. Individual endangered or threatened bird and mammal species located in counties that produce soybeans are identified in Appendix C. Only avian endangered species LOCs were exceeded; however, potential indirect effects on species that depend on birds for survival or reproduction cannot be ruled out at this time.

II. WATER ASSESSMENT FOR THE USE OF FLUTRIAFOL ON SOYBEAN

Surface Water Modeling

A Tier II water assessment was conducted for the proposed use of flutriafol on soybeans using the proposed maximum application rate for soybean; 0.0569 lbs ai/acre with 2 applications at 7 days

interval (assumed because not specified).

Modeling of the Estimated Drinking Water Concentrations (EDWC) and Estimated Environmental Concentrations (EEC) were generated using PRZM3 (Vers. 3.12 beta compiled(05/24/01, Carsel, 1997) and EXAMS (Vers. 2.98.04 compiled 07/18/04, Burns, 2002). PRZM simulates pesticide fate and transport as a result of leaching, direct spray drift, runoff and erosion from an agricultural field and EXAMS estimates environmental fate and transport of pesticides in a surface water body for a 30-year period (1961 to 1990). Standard soybean cropping scenarios for three states with the highest soybean acreage and highest runoff vulnerability were simulated to represent the national use of flutriafol on this crop: Georgia, Michigan, and Mississippi.

The EECs for surface water uses a single site or multiple sites, which typically represents a high-end exposure scenario from pesticide use on a particular crop or noncrop use site. PRZM and EXAMS were linked by the program (PE4-PL, ver. 01). Detailed description, documentation, and direct links for running these models can be found in: http://www.epa.gov/oppefed1/models/water/index.htm. The standard scenario for ecological exposure simulates the fate of a pesticide transported as a result of runoff and erosion, and or spray drift from an 10-ha agricultural field directly into a surface water body (PRZM). The small field is assumed to be 100% cropped. The surface water body in which the EECs are simulated (EXAMS) is the standard pond (10,000-m2 pond, 2-m deep).

The Index Reservoir (IR) is intended as a drop-in replacement for the standard pond for use in drinking water exposure assessment. It is used in a manner similar to the standard pond, except that flow rates have been modified to reflect local weather conditions. Guidance for using the IR is located at: http://www.epa.gov/pesticides/trac/science/. The index reservoir (IR) is approximately 82 m wide and 640 m long, with an area of 5.3 ha. (USEPA, 2000). The area of the entire watershed is 172.8 ha. Weather and agricultural practices are simulated for 30 years so that the 10-year exceedance probability at the site can be estimated. The simulation was generated using 30 years of meteorological data, encompassing the years from 1961 to 1990.

The Percent Crop Area (PCA) is a generic watershed-based adjustment factor that will be applied to pesticide concentrations estimated for the surface water component of the drinking water exposure assessment using PRZM/EXAMS with the index reservoir (IR) only. No adjustment was made for the standard pond runs. The output generated by the linked PRZM/EXAMS models is multiplied by the maximum percent of crop area (PCA) in any watershed (expressed as a decimal) generated for the crop or crops of interest. Currently, OPP will apply PCA adjustments for four major crops, one of which is soybeans. The default PCA factor for soybeans is 0.41. Guidance for using PCAs and a thorough discussion of this method and comparisons of monitoring and modeling results for selected pesticide/crop/site combinations is located at: http://www.epa.gov/pesticides/trac/science/.

Table II-1 presents the input parameters used in the PRZM/EXAMS modeling. The estimated concentrations of flutriafol in surface drinking water (EDWCs) are presented in Table **II-2** and for aquatic exposure (EECs) in Table **II-3**. Print outs of the surface water modeling runs are listed in

Appendix A.

Ground Water Modeling

The SCI-GROW model version 2.3 was used to estimate the concentration of flutriafol in ground water. SCI-GROW estimated the concentration of flutriafol in shallow ground water sources to be **less than 1 µg/L**. Input parameters for SCI-GROW are also presented in Table II-1. Note that no PCA adjustment is required for SCI-GROW. Print outs of the surface water modeling runs are listed in **Appendix B**.

Environmental Fate

Flutriafol is a systemic fungicide with eradicating action. Similar to all triazoles, flutriafol acts as a steroid demethylation inhibitor, causing fungal cell wall to collapse and inhibiting hyphal growth.

The vapor pressure of flutriafol indicates that volatility is not a major route of degradation for this chemical in the environment. Hydrolysis and aqueous photolysis are also very slow. In soil, flutriafol is quite persistent, with a half life value of more than one year. No significant degradation products were identified in either water or soil studies. As indicated by the adsorption/desorption coefficients, flutriafol is moderately mobile in the laboratory tested soils. Field studies show that there is minimal potential for flutriafol to significantly leach to ground water under practical use conditions.

Key chemical-physical and environmental fate properties of flutriafol used in the surface and ground water modeling are summarized in Table II-1. The environmental fate data and physical and chemical properties (**Table II-1**) were selected from the available non guideline study reports in accordance with Guidance for Selecting Input Parameters in Modeling the Environmental Fate and Transport of Pesticides, Version II, February 28, 2002. Detailed description, documentation, and direct links for running these models can be found in:
http://www.epa.gov/oppefed1/models/water/index.htm

Table II-1. PRZM/EXAMS and SCI-GROW Input Parameters for Flutriafol use on Soybean.

Parameter	Value and Unit	Source
Max. application rate	2 applications @ 0.0569 lb ai/acre	Section 18 request
Maximum # of applications	2	Section 18 request
Reapplication Interval	7 and 14 days	not provided so assumed
Application Efficiency (APPEFF)	0.95 - aerial spray	EFED Guidance
Spray Drift (DRFT)	0.05 eco-aerial spray (as)	EFED Guidance

Table II-1. PRZM/EXAMS and SCI-GROW Input Parameters for Flutriafol use on Soybean.		
Parameter	Value and Unit	Source
	0.16 drinking water as	
Chemical Application Method (CAM)	2 (foliar application)	Proposed use
Molecular Formula Mole Wt. g/mol	$C_{16}H_{13}F_2N_3O$ 301.3	[1]
Henry's Law Constant (20°C) Vapor Pressure (calculated)	1.3×10^{-11} atm x m^3 x mol^{-1} 4×10^{-7} Pa at 20°C	[1]
Solubility in water	95 mg/L (20°C in water)	[1]
Partition Coefficients [sorption-desorption] Freundlich K_f mL/g	1.3 - 9.8 (n=5)	[1]
Partition Coefficients K_{oc} mL/g	123, 157, 295, 304, 395 (mean=255; n=5) 1/n=0.94-0.97 PRZM/EXAMS = 255 (mean) SCI-GROW input = 295 (median)	[1]
Hydrolysis	stable in buffered solutions at pH 4, 7, and 9 at 25 C within 30 days incubation in dark	[1]
Aqueous photolysis	stable in aqueous buffer solution (pH 7) at 25 C for periods up to the equivalent of 66 days FL summer sunlight	[1]
Aerobic soil metabolism [half-life] days	1747 (mean first order; 672-3492 days, n=10) PRZM/EXAMS, SCI-GROW = 1747 (mean, no raw data (only range) were available to calculate 90th percentile of mean)	[1]
Anaerobic aquatic metabolism [half-life] days	no data; compound stable to hydrolysis PRZM/EXAMS =3500 (2 x aerobic soil metabolism)	[1]
Soil photolysis	stable to sunlight of soil surfaces	[1]
Aerobic aquatic metabolism	no data	[1]

[1]- Cheminova A/S- Document N (Tier 3), July 2004

The Tier II assessment for flutriafol concentrations in **Table II-2** are the 1-in-10-year annual exceedance probability for peak (acute), annual daily average (chronic), and overall daily average (cancer) concentrations in the Index Reservoir for 2 aerial applications applied at the maximum proposed rate of 0.0569 lb a.i./Acre each, at 7-day interval between application, for 30 years.

Table II-2. Tier II PRZM/EXAMS Flutriafol Estimated Drinking Water Concentrations (EDWCs) in Index

Reservoir corrected for percent crop area (PCA = 0.41 for soybeans), based on 2 aerial applications of 0.0569 lb a.i./Acre each, and 7-day interval between application			
	1-in-10 year EDWC (ug/L)		
Scenario	**Acute**	**Chronic**	**Cancer**
MI Bean	4	2	1
GA Soybean	3	1	<1
MS Soybean	2	1	<1

Tier II assessment flutriafol concentrations in **Table II-3** represent the 1-in-10-year annual exceedance probability for peak, 96-hr, 21-day, 60-day, and 90-day in the standard farm pond for ground and aerial applications applied at the maximum proposed rate for 30 years.

Table II-3. Tier II PRZM/EXAMS Flutriafol Estimated Environmental Concentrations (EECs) in Standard Farm Pond, based on 2 aerial applications of 0.0569 lb a.i./Acre each, and 7-day interval between application					
	1-in-10 year EEC (ug/L)				
Scenario	**Peak**	**96-hr**	**21-day**	**60-day**	**90-day**
GA Soybean	25	25	25	24	24
MI Bean	17	17	17	17	17
MS Soybean	11	11	11	11	11

Additional Citations

EPA. 1999. Jones, R.D., J. Breithaupt, J. Carleton, L. Libelo, J. Lin, R. Matzner, and R. Parker. Guidance for Use of the Index Reservoir in Drinking Water Exposure Assessments. Environmental Fate and Effects Division, Office of Pesticide Programs, U.S. Environmental Protection Agency, Washington. D.C.

USDA. 2005. A Coordinated Framework for Soybean Rust Surveillance, Reporting, Prediction, Management and Outreach. page 24, http://www.aphis.usda.gov/ppq/ep/soybean_rust/coordfram041405.pdf

Appendix A. PRZM/EXAMS printouts

PRZM environment: **GAsoybeanC.txt** modified Friday, 14 October 2005 at 15:22:04
EXAMS environment: **ir298.exv** modified Thuday, 29 August 2002 at 15:34:12
Metfile: w93805.dvf modified Wedday, 3 July 2002 at 09:04:32
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	1.539	1.487	1.304	0.8502	0.7725	0.2525
1962	3.733	3.6	3.215	2.472	2.137	0.8471
1963	5.343	5.161	4.472	3.323	2.831	0.9915
1964	6.327	6.168	5.358	4.368	3.885	1.444
1965	4.469	4.316	4.072	3.501	3.086	1.314
1966	7.962	7.676	6.975	5.37	4.444	1.465
1967	2.98	2.879	2.5	2.076	1.905	0.896
1968	5.382	5.199	4.863	4.125	3.661	1.35
1969	15.85	15.31	13.22	9.803	8.075	2.477
1970	3.073	2.988	2.666	2.109	1.802	1.078
1971	2.304	2.226	1.939	1.516	1.379	0.5352
1972	3.998	3.86	3.391	2.798	2.049	0.7695
1973	2.332	2.257	1.979	1.56	1.451	0.8974
1974	4.364	4.233	3.899	3.088	2.574	0.9386
1975	2.801	2.702	2.497	2.247	1.946	0.7621
1976	6.763	6.524	5.72	4.386	3.63	1.177
1977	1.82	1.768	1.568	1.229	1.043	0.6177
1978	1.18	1.141	0.852	0.7453	0.6717	0.3034
1979	4.071	3.926	3.431	2.63	2.285	0.8537
1980	2.015	1.945	1.737	1.582	1.423	0.644
1981	2.016	1.956	1.834	1.463	1.35	0.553
1982	2.682	2.588	2.241	1.806	1.566	0.6014
1983	2.721	2.628	2.459	1.732	1.474	0.6236
1984	1.782	1.725	1.512	1.159	0.9702	0.618
1985	4.985	4.84	4.197	3.439	2.514	0.8286
1986	2.295	2.214	2.046	1.653	1.578	0.9453
1987	2.573	2.484	2.153	1.493	1.235	0.6351
1988	2.565	2.476	2.146	1.72	1.625	0.7578
1989	4.306	4.154	3.626	2.899	2.462	0.9144
1990	1.979	1.911	1.704	1.461	1.259	0.6107

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.032258064516129	15.85	15.31	13.22	9.803	8.075	2.477
0.0645161290322581	7.962	7.676	6.975	5.37	4.444	1.465
0.0967741935483871	6.763	6.524	5.72	4.386	3.885	1.444
0.129032258064516	6.327	6.168	5.358	4.368	3.661	1.35
0.161290322580645	5.382	5.199	4.863	4.125	3.63	1.314
0.193548387096774	5.343	5.161	4.472	3.501	3.086	1.177
0.225806451612903	4.985	4.84	4.197	3.439	2.831	1.078
0.258064516129032	4.469	4.316	4.072	3.323	2.574	0.9915
0.290322580645161	4.364	4.233	3.899	3.088	2.514	0.9453
0.32258064516129	4.306	4.154	3.626	2.899	2.462	0.9386
0.354838709677419	4.071	3.926	3.431	2.798	2.285	0.9144
0.387096774193548	3.998	3.86	3.391	2.63	2.137	0.8974

0.419354838709677	3.733	3.6	3.215	2.472	2.049	0.896
0.451612903225806	3.073	2.988	2.666	2.247	1.946	0.8537
0.483870967741936	2.98	2.879	2.5	2.109	1.905	0.8471
0.516129032258065	2.801	2.702	2.497	2.076	1.802	0.8286
0.548387096774194	2.721	2.628	2.459	1.806	1.625	0.7695
0.580645161290323	2.682	2.588	2.241	1.732	1.578	0.7621
0.612903225806452	2.573	2.484	2.153	1.72	1.566	0.7578
0.645161290322581	2.565	2.476	2.146	1.653	1.474	0.644
0.67741935483871	2.332	2.257	2.046	1.582	1.451	0.6351
0.709677419354839	2.304	2.226	1.979	1.56	1.423	0.6236
0.741935483870968	2.295	2.214	1.939	1.516	1.379	0.618
0.774193548387097	2.016	1.956	1.834	1.493	1.35	0.6177
0.806451612903226	2.015	1.945	1.737	1.463	1.259	0.6107
0.838709677419355	1.979	1.911	1.704	1.461	1.235	0.6014
0.870967741935484	1.82	1.768	1.568	1.229	1.043	0.553
0.903225806451613	1.782	1.725	1.512	1.159	0.9702	0.5352
0.935483870967742	1.539	1.487	1.304	0.8502	0.7725	0.3034
0.967741935483871	1.18	1.141	0.852	0.7453	0.6717	0.2525
0.1	6.7194	6.4884	5.6838	4.3842	3.8626	1.4346
					Average of yearly	
averages:	0.890053333333334					

Inputs generated by pe4.pl - 8-August-2003

Data used for this run:
Output File: flusbi

Metfile:	w93805.dvf				
PRZM scenario:	GAsoybeanC.txt				
EXAMS environment file:	ir298.exv				
Chemical Name:	flutriafol				
Description	Variable Name	Value	Units	Comments	
Molecular weight	mwt	301	g/mol		
Henry's Law Const.	henry	1.3E-11	atm-m^3/mol		
Vapor Pressure	vapr	3E-09	torr		
Solubility	sol	95	mg/L		
Kd	Kd		mg/L		
Koc	Koc	255	mg/L		
Photolysis half-life	kdp	0	days	Half-life	
Aerobic Aquatic Metabolism		kbacw	1000	days	Halfife
Anaerobic Aquatic Metabolism		kbacs	3600	days	Halfife
Aerobic Soil Metabolism	asm	1747	days	Halfife	
Hydrolysis:	pH 7	0	days	Half-life	
Method:	CAM	2	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm		
Application Rate:	TAPP	0.0637	kg/ha		
Application Efficiency:	APPEFF	0.95	fraction		
Spray Drift	DRFT	0.16	fraction of application rate applied to pond		
Application Date	Date	01-09	dd/mm or dd/mmm or dd-mm or dd-mmm		
Interval 1	interval	14	days	Set to 0 or delete line for single app.	
Record 17:	FILTRA				
	IPSCND				
	UPTKF				

Record 18:	PLVKRT		
	PLDKRT		
	FEXTRC	0.5	
Flag for Index Res. Run	IR	IR	
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)

PRZM environment: **MIbeansC.txt** modified Monday, 10 May 2004 at 07:24:24
EXAMS environment: **ir298.exv** modified Thuday, 29 August 2002 at 15:34:12
Metfile: w14826.dvf modified Wedday, 3 July 2002 at 09:05:38
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	5.639	5.565	5.318	4.933	4.654	1.646
1962	3.187	3.16	3.049	2.826	2.676	2.142
1963	2.42	2.394	2.328	2.285	2.191	1.565
1964	2.495	2.467	2.356	2.141	2.072	1.487
1965	5.198	5.133	4.882	4.666	4.393	2.318
1966	3.098	3.073	2.968	2.753	2.609	2.161
1967	2.8	2.768	2.643	2.523	2.54	1.736
1968	9.874	9.763	9.299	8.375	7.798	3.644
1969	5.268	5.225	5.053	4.702	4.456	3.236
1970	4.187	4.143	3.995	3.914	3.766	2.395
1971	2.964	2.939	2.839	2.635	2.498	2.043
1972	3.424	3.389	3.311	3.185	3.096	1.986
1973	3.548	3.507	3.389	3.269	3.283	2.138
1974	3.011	2.983	2.873	2.658	2.51	2.062
1975	11.89	11.78	11.48	10.56	9.851	4.105
1976	6.486	6.431	6.209	5.752	5.442	4.164
1977	3.444	3.417	3.304	3.077	2.938	2.538
1978	3.491	3.466	3.343	3.064	2.877	1.986
1979	2.257	2.238	2.161	2.002	1.901	1.581
1980	3.427	3.388	3.241	2.972	2.797	1.674
1981	4.722	4.669	4.475	4.235	4.057	2.34
1982	3.273	3.238	3.192	3.062	3.032	2.367
1983	3.71	3.667	3.519	3.364	3.196	2.18
1984	2.794	2.764	2.652	2.529	2.461	1.944
1985	9.035	8.925	8.509	7.739	7.224	3.259
1986	9.777	9.676	9.429	8.8	8.316	4.942
1987	6.892	6.815	6.587	6.029	5.727	4.571
1988	4.695	4.646	4.472	4.176	4.117	3.3
1989	5.335	5.274	5.051	4.598	4.38	2.976
1990	3.756	3.717	3.571	3.452	3.408	2.602

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.032258064516129	11.89	11.78	11.48	10.56	9.851	4.942
0.0645161290322581	9.874	9.763	9.429	8.8	8.316	4.571
0.0967741935483871	9.777	9.676	9.299	8.375	7.798	4.164
0.129032258064516	9.035	8.925	8.509	7.739	7.224	4.105
0.161290322580645	6.892	6.815	6.587	6.029	5.727	3.644
0.193548387096774	6.486	6.431	6.209	5.752	5.442	3.3
0.225806451612903	5.639	5.565	5.318	4.933	4.654	3.259

0.258064516129032	5.335	5.274	5.053	4.702	4.456	3.236
0.290322580645161	5.268	5.225	5.051	4.666	4.393	2.976
0.32258064516129	5.198	5.133	4.882	4.598	4.38	2.602
0.354838709677419	4.722	4.669	4.475	4.235	4.117	2.538
0.387096774193548	4.695	4.646	4.472	4.176	4.057	2.395
0.419354838709677	4.187	4.143	3.995	3.914	3.766	2.367
0.451612903225806	3.756	3.717	3.571	3.452	3.408	2.34
0.483870967741936	3.71	3.667	3.519	3.364	3.283	2.318
0.516129032258065	3.548	3.507	3.389	3.269	3.196	2.18
0.548387096774194	3.491	3.466	3.343	3.185	3.096	2.161
0.580645161290323	3.444	3.417	3.311	3.077	3.032	2.142
0.612903225806452	3.427	3.389	3.304	3.064	2.938	2.138
0.645161290322581	3.424	3.388	3.241	3.062	2.877	2.062
0.67741935483871	3.273	3.238	3.192	2.972	2.797	2.043
0.709677419354839	3.187	3.16	3.049	2.826	2.676	1.986
0.741935483870968	3.098	3.073	2.968	2.753	2.609	1.986
0.774193548387097	3.011	2.983	2.873	2.658	2.54	1.944
0.806451612903226	2.964	2.939	2.839	2.635	2.51	1.736
0.838709677419355	2.8	2.768	2.652	2.529	2.498	1.674
0.870967741935484	2.794	2.764	2.643	2.523	2.461	1.646
0.903225806451613	2.495	2.467	2.356	2.285	2.191	1.581
0.935483870967742	2.42	2.394	2.328	2.141	2.072	1.565
0.967741935483871	2.257	2.238	2.161	2.002	1.901	1.487
0.1	9.7028	9.6009	9.22	8.3114	7.7406	4.1581
					Average of yearly	
averages:	2.5696					

Inputs generated by pe4.pl - 8-August-2003

Data used for this run:
Output File: flubmi

Metfile:	w14826.dvf				
PRZM scenario:	MIbeansC.txt				
EXAMS environment file:	ir298.exv				
Chemical Name:	flutriafol				
Description	Variable Name	Value	Units	Comments	
Molecular weight	mwt	301	g/mol		
Henry's Law Const.	henry	1.3E-11	atm-m^3/mol		
Vapor Pressure	vapr	3E-09	torr		
Solubility	sol	95	mg/L		
Kd	Kd		mg/L		
Koc	Koc	255	mg/L		
Photolysis half-life	kdp	0	days	Half-life	
Aerobic Aquatic Metabolism		kbacw	1000	days	Halfife
Anaerobic Aquatic Metabolism		kbacs	3500	days	Halfife
Aerobic Soil Metabolism	asm	1747	days	Halfife	
Hydrolysis:	pH 7	0	days	Half-life	
Method:	CAM	2	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm		
Application Rate:	TAPP	0.0637	kg/ha		
Application Efficiency:	APPEFF	0.95	fraction		
Spray Drift	DRFT	0.16	fraction of application rate applied to pond		

Application Date	Date	27-07	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	14	days	Set to 0 or delete line for single app.
Record 17:	FILTRA			
	IPSCND			
	UPTKF			
Record 18:	PLVKRT			
	PLDKRT			
	FEXTRC	0.5		
Flag for Index Res. Run	IR	IR		
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)	

PRZM environment: **MSsoybeanC.txt** modified Satday, 12 October 2002 at 17:07:44
EXAMS environment: **ir298.exv** modified Thuday, 29 August 2002 at 15:34:12
Metfile: w13893.dvf modified Wedday, 3 July 2002 at 09:06:20
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	3.177	3.101	2.853	2.505	1.856	0.5011
1962	2.383	2.325	2.113	1.843	1.672	1.086
1963	1.567	1.529	1.383	1.205	1.08	0.6425
1964	2.107	2.059	1.972	1.709	1.61	0.8389
1965	3.327	3.263	3.118	2.631	2.296	1.103
1966	2.448	2.388	2.168	1.789	1.629	0.9192
1967	2.488	2.43	2.265	1.69	1.527	0.7947
1968	5.557	5.417	4.952	4.326	3.882	1.586
1969	3.375	3.294	3.018	2.254	1.735	1.143
1970	2.798	2.736	2.498	2.081	1.87	1.28
1971	1.784	1.743	1.608	0.9949	0.9401	0.652
1972	4.497	4.383	3.959	3.758	3.446	1.3
1973	2.691	2.626	2.448	2.131	1.962	1.218
1974	1.418	1.386	1.351	1.209	1.076	0.6875
1975	2.606	2.553	2.347	2.088	1.891	0.8271
1976	4.181	4.083	3.753	3.294	3.28	1.417
1977	4.241	4.149	3.863	3.241	2.935	1.41
1978	3.744	3.661	3.448	2.545	2.076	1.091
1979	2.86	2.798	2.556	2.117	2.047	1.368
1980	3.255	3.173	2.88	2.713	2.568	1.187
1981	6.088	5.936	5.639	4.677	3.794	1.484
1982	3.453	3.39	3.139	2.704	2.51	1.54
1983	3.006	2.936	2.765	2.258	1.924	1.068
1984	2.207	2.154	2.002	1.768	1.583	0.9988
1985	1.735	1.693	1.581	1.461	1.395	0.7179
1986	6.986	6.869	6.289	5.184	4.018	1.342
1987	5.003	4.884	4.541	3.722	2.9	1.821
1988	3.251	3.182	2.914	2.426	2.137	1.459
1989	3.993	3.898	3.582	3.445	3.225	1.394
1990	3.706	3.624	3.315	2.973	2.727	1.363

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.032258064516129	6.986	6.869	6.289	5.184	4.018	1.821
0.0645161290322581	6.088	5.936	5.639	4.677	3.882	1.586
0.0967741935483871	5.557	5.417	4.952	4.326	3.794	1.54

0.129032258064516	5.003	4.884	4.541	3.758	3.446	1.484
0.161290322580645	4.497	4.383	3.959	3.722	3.28	1.459
0.193548387096774	4.241	4.149	3.863	3.445	3.225	1.417
0.225806451612903	4.181	4.083	3.753	3.294	2.935	1.41
0.258064516129032	3.993	3.898	3.582	3.241	2.9	1.394
0.290322580645161	3.744	3.661	3.448	2.973	2.727	1.368
0.32258064516129	3.706	3.624	3.315	2.713	2.568	1.363
0.354838709677419	3.453	3.39	3.139	2.704	2.51	1.342
0.387096774193548	3.375	3.294	3.118	2.631	2.296	1.3
0.419354838709677	3.327	3.263	3.018	2.545	2.137	1.28
0.451612903225806	3.255	3.182	2.914	2.505	2.076	1.218
0.483870967741936	3.251	3.173	2.88	2.426	2.047	1.187
0.516129032258065	3.177	3.101	2.853	2.258	1.962	1.143
0.548387096774194	3.006	2.936	2.765	2.254	1.924	1.103
0.580645161290323	2.86	2.798	2.556	2.131	1.891	1.091
0.612903225806452	2.798	2.736	2.498	2.117	1.87	1.086
0.645161290322581	2.691	2.626	2.448	2.088	1.856	1.068
0.67741935483871	2.606	2.553	2.347	2.081	1.735	0.9988
0.709677419354839	2.488	2.43	2.265	1.843	1.672	0.9192
0.741935483870968	2.448	2.388	2.168	1.789	1.629	0.8389
0.774193548387097	2.383	2.325	2.113	1.768	1.61	0.8271
0.806451612903226	2.207	2.154	2.002	1.709	1.583	0.7947
0.838709677419355	2.107	2.059	1.972	1.69	1.527	0.7179
0.870967741935484	1.784	1.743	1.608	1.461	1.395	0.6875
0.903225806451613	1.735	1.693	1.581	1.209	1.08	0.652
0.935483870967742	1.567	1.529	1.383	1.205	1.076	0.6425
0.967741935483871	1.418	1.386	1.351	0.9949	0.9401	0.5011
0.1	5.5016	5.3637	4.9109	4.2692	3.7592	1.5344
					Average of yearly	
averages:	1.14132333333333					

Inputs generated by pe4.pl - 8-August-2003

Data used for this run:
Output File: flusbi

Metfile:	w13893.dvf				
PRZM scenario:	MSsoybeanC.txt				
EXAMS environment file:	ir298.exv				
Chemical Name:	flutriafol				
Description	Variable Name	Value	Units	Comments	
Molecular weight	mwt	301	g/mol		
Henry's Law Const.	henry	1.3E-11	atm-m^3/mol		
Vapor Pressure	vapr	3E-09	torr		
Solubility	sol	95	mg/L		
Kd	Kd		mg/L		
Koc	Koc	255	mg/L		
Photolysis half-life	kdp	0	days	Half-life	
Aerobic Aquatic Metabolism		kbacw	1000	days	Halfife
Anaerobic Aquatic Metabolism		kbacs	3500	days	Halfife
Aerobic Soil Metabolism	asm	1747	days	Halfife	
Hydrolysis:	pH 7	0	days	Half-life	
Method:	CAM	2	integer	See PRZM manual	

Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	0.0637	kg/ha	
Application Efficiency:	APPEFF	0.95	fraction	
Spray Drift	DRFT	0.16	fraction of application rate applied to pond	
Application Date	Date	01-09	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	14	days	Set to 0 or delete line for single app.
Record 17:	FILTRA			
	IPSCND			
	UPTKF			
Record 18:	PLVKRT			
	PLDKRT			
	FEXTRC	0.5		
Flag for Index Res. Run	IR	IR		
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)	

PRZM environment: **GAsoybeanC.txt** modified Friday, 14 October 2005 at 15:22:04
EXAMS environment: **pond298.exv** modified Thuday, 29 August 2002 at 16:33:30
Metfile: w93805.dvf modified Wedday, 3 July 2002 at 09:04:32
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	1.988	1.976	1.848	1.306	1.154	0.3452
1962	4.844	4.809	4.679	4.534	4.527	2.515
1963	8.296	8.251	8.08	7.77	7.705	5.08
1964	12.83	12.78	12.57	12.3	12.09	8.488
1965	14.91	14.86	14.68	14.45	14.3	12.14
1966	19	18.92	18.73	18.38	18.13	14.57
1967	18.03	18	17.91	17.78	17.41	16.6
1968	20.61	20.57	20.39	20.29	20.19	17.88
1969	30.59	30.45	29.87	28.86	28.36	21.53
1970	26.96	26.93	26.83	26.63	26.49	25.33
1971	24.68	24.66	24.61	24.5	24.41	23.54
1972	24.29	24.25	24.12	23.54	23.16	22.36
1973	23.86	23.83	23.73	23.55	23.4	22.48
1974	23.71	23.67	23.46	23.18	23	21.81
1975	22.58	22.54	22.42	22.29	22.18	21.57
1976	25.06	24.99	24.77	24.43	24.11	21.62
1977	23.73	23.71	23.64	23.5	23.38	22.19
1978	21.3	21.3	21.26	21.19	21.12	20.15
1979	21.21	21.15	20.97	20.72	20.64	19.49
1980	20.36	20.35	20.29	20.17	20.08	19.36
1981	19.28	19.27	19.23	19.14	19.06	18.48
1982	18.71	18.67	18.52	18.38	18.3	17.79
1983	18.65	18.63	18.55	17.93	17.72	17.25
1984	18.48	18.46	18.38	18.24	18.14	17.35
1985	19.23	19.18	19.04	18.97	17.92	16.67
1986	18.82	18.8	18.74	18.47	18.36	17.86
1987	18.63	18.59	18.49	18.37	18.28	17.62
1988	18.46	18.44	18.37	18.16	18.18	17.55
1989	19.77	19.72	19.55	19.33	19.21	17.81
1990	18.87	18.85	18.79	18.65	18.54	17.84

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.032258064516129	30.59	30.45	29.87	28.86	28.36	25.33
0.0645161290322581	26.96	26.93	26.83	26.63	26.49	23.54
0.0967741935483871	25.06	24.99	24.77	24.5	24.41	22.48
0.129032258064516	24.68	24.66	24.61	24.43	24.11	22.36
0.161290322580645	24.29	24.25	24.12	23.55	23.4	22.19
0.193548387096774	23.86	23.83	23.73	23.54	23.38	21.81
0.225806451612903	23.73	23.71	23.64	23.5	23.16	21.62
0.258064516129032	23.71	23.67	23.46	23.18	23	21.57
0.290322580645161	22.58	22.54	22.42	22.29	22.18	21.53
0.32258064516129	21.3	21.3	21.26	21.19	21.12	20.15
0.354838709677419	21.21	21.15	20.97	20.72	20.64	19.49
0.387096774193548	20.61	20.57	20.39	20.29	20.19	19.36
0.419354838709677	20.36	20.35	20.29	20.17	20.08	18.48
0.451612903225806	19.77	19.72	19.55	19.33	19.21	17.88
0.483870967741936	19.28	19.27	19.23	19.14	19.06	17.86
0.516129032258065	19.23	19.18	19.04	18.97	18.54	17.84
0.548387096774194	19	18.92	18.79	18.65	18.36	17.81
0.580645161290323	18.87	18.85	18.74	18.47	18.3	17.79
0.612903225806452	18.82	18.8	18.73	18.38	18.28	17.62
0.645161290322581	18.71	18.67	18.55	18.38	18.18	17.55
0.67741935483871	18.65	18.63	18.52	18.37	18.14	17.35
0.709677419354839	18.63	18.59	18.49	18.24	18.13	17.25
0.741935483870968	18.48	18.46	18.38	18.16	17.92	16.67
0.774193548387097	18.46	18.44	18.37	17.93	17.72	16.6
0.806451612903226	18.03	18	17.91	17.78	17.41	14.57
0.838709677419355	14.91	14.86	14.68	14.45	14.3	12.14
0.870967741935484	12.83	12.78	12.57	12.3	12.09	8.488
0.903225806451613	8.296	8.251	8.08	7.77	7.705	5.08
0.935483870967742	4.844	4.809	4.679	4.534	4.527	2.515
0.967741935483871	1.988	1.976	1.848	1.306	1.154	0.3452
0.1	25.022	24.957	24.754	24.493	24.38	22.468
					Average of yearly	
averages:	17.1756066666667					

Inputs generated by pe4.pl - 8-August-2003

Data used for this run:
Output File: flusbp
Metfile: w93805.dvf
PRZM scenario: GAsoybeanC.txt
EXAMS environment file: pond298.exv
Chemical Name: flutriafol

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	301	g/mol	
Henry's Law Const.	henry	1.3E-11	atm-m^3/mol	
Vapor Pressure	vapr	3E-09	torr	
Solubility	sol	95	mg/L	
Kd	Kd		mg/L	
Koc	Koc	255	mg/L	
Photolysis half-life	kdp	0	days	Half-life

Aerobic Aquatic Metabolism		kbacw	1000	days	Halfife
Anaerobic Aquatic Metabolism		kbacs	3600	days	Halfife
Aerobic Soil Metabolism	asm	1747	days	Halfife	
Hydrolysis:	pH 7	0	days	Half-life	
Method:	CAM	2	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm		
Application Rate:	TAPP	0.125	kg/ha		
Application Efficiency:	APPEFF	0.95	fraction		
Spray Drift	DRFT	0.05	fraction of application rate applied to pond		
Application Date	Date	01-09	dd/mm or dd/mmm or dd-mm or dd-mmm		
Interval 1	interval	14	days	Set to 0 or delete line for single app.	
Record 17:	FILTRA				
	IPSCND				
	UPTKF				
Record 18:	PLVKRT				
	PLDKRT				
	FEXTRC	0.5			
Flag for Index Res. Run	IR	Pond			
Flag for runoff calc.	RUNOFF	none	none, monthly or total(average of entire run)		

PRZM environment: **MIbeansC.txt** modified Monday, 10 May 2004 at 07:24:24
EXAMS environment: **pond298.exv** modified Thuday, 29 August 2002 at 16:33:30
Metfile: w14826.dvf modified Wedday, 3 July 2002 at 09:05:38
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	2.433	2.413	2.345	2.293	2.26	0.8431
1962	2.56	2.555	2.543	2.521	2.508	2.203
1963	3.12	3.114	3.092	3.059	3.054	2.679
1964	3.671	3.664	3.637	3.594	3.586	3.201
1965	5.299	5.284	5.229	5.191	5.15	4.146
1966	5.322	5.315	5.3	5.281	5.262	5.05
1967	5.934	5.929	5.912	5.889	5.86	5.415
1968	9.309	9.279	9.155	8.937	8.825	6.898
1969	8.521	8.516	8.501	8.475	8.455	8.33
1970	9.345	9.334	9.298	9.247	9.231	8.572
1971	9.141	9.138	9.125	9.099	9.082	8.973
1972	9.711	9.703	9.679	9.641	9.63	9.169
1973	10.17	10.16	10.13	10.08	10.03	9.551
1974	10.1	10.09	10.07	10.04	10.02	9.888
1975	14.07	14.04	13.93	13.72	13.57	11.07
1976	13.13	13.12	13.07	13.01	12.98	12.75
1977	12.92	12.91	12.89	12.86	12.84	12.68
1978	12.95	12.94	12.89	12.8	12.76	12.52
1979	12.64	12.64	12.62	12.59	12.57	12.31
1980	12.63	12.61	12.57	12.49	12.45	12.1
1981	13.26	13.25	13.2	13.11	13.06	12.42
1982	12.99	12.98	12.96	12.92	12.92	12.73
1983	13.13	13.11	13.05	13.03	13	12.71
1984	12.87	12.86	12.85	12.82	12.79	12.64
1985	15.32	15.29	15.16	14.96	14.85	13.18
1986	16.95	16.92	16.84	16.67	16.58	14.94

1987	16.99	16.97	16.89	16.75	16.68	16.12
1988	16.61	16.59	16.54	16.48	16.46	16.22
1989	17.09	17.06	16.99	16.85	16.78	16.3
1990	16.58	16.57	16.54	16.51	16.48	16.31

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.032258064516129	17.09	17.06	16.99	16.85	16.78	16.31
0.0645161290322581	16.99	16.97	16.89	16.75	16.68	16.3
0.0967741935483871	16.95	16.92	16.84	16.67	16.58	16.22
0.129032258064516	16.61	16.59	16.54	16.51	16.48	16.12
0.161290322580645	16.58	16.57	16.54	16.48	16.46	14.94
0.193548387096774	15.32	15.29	15.16	14.96	14.85	13.18
0.225806451612903	14.07	14.04	13.93	13.72	13.57	12.75
0.258064516129032	13.26	13.25	13.2	13.11	13.06	12.73
0.290322580645161	13.13	13.12	13.07	13.03	13	12.71
0.32258064516129	13.13	13.11	13.05	13.01	12.98	12.68
0.354838709677419	12.99	12.98	12.96	12.92	12.92	12.64
0.387096774193548	12.95	12.94	12.89	12.86	12.84	12.52
0.419354838709677	12.92	12.91	12.89	12.82	12.79	12.42
0.451612903225806	12.87	12.86	12.85	12.8	12.76	12.31
0.483870967741936	12.64	12.64	12.62	12.59	12.57	12.1
0.516129032258065	12.63	12.61	12.57	12.49	12.45	11.07
0.548387096774194	10.17	10.16	10.13	10.08	10.03	9.888
0.580645161290323	10.1	10.09	10.07	10.04	10.02	9.551
0.612903225806452	9.711	9.703	9.679	9.641	9.63	9.169
0.645161290322581	9.345	9.334	9.298	9.247	9.231	8.973
0.67741935483871	9.309	9.279	9.155	9.099	9.082	8.572
0.709677419354839	9.141	9.138	9.125	8.937	8.825	8.33
0.741935483870968	8.521	8.516	8.501	8.475	8.455	6.898
0.774193548387097	5.934	5.929	5.912	5.889	5.86	5.415
0.806451612903226	5.322	5.315	5.3	5.281	5.262	5.05
0.838709677419355	5.299	5.284	5.229	5.191	5.15	4.146
0.870967741935484	3.671	3.664	3.637	3.594	3.586	3.201
0.903225806451613	3.12	3.114	3.092	3.059	3.054	2.679
0.935483870967742	2.56	2.555	2.543	2.521	2.508	2.203
0.967741935483871	2.433	2.413	2.345	2.293	2.26	0.8431
0.1	16.916	16.887	16.81	16.654	16.57	16.21
					Average of yearly	
averages:	10.0639366666667					

Inputs generated by pe4.pl - 8-August-2003
Data used for this run:
Output File: flubmp
Metfile: w14826.dvf
PRZM scenario: MIbeansC.txt
EXAMS environment file: pond298.exv
Chemical Name: flutriafol

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	301	g/mol	
Henry's Law Const.	henry	1.3E-11	atm-m^3/mol	
Vapor Pressure	vapr	3E-09	torr	

Solubility	sol	95	mg/L		
Kd	Kd		mg/L		
Koc	Koc	255	mg/L		
Photolysis half-life	kdp	0	days	Half-life	
Aerobic Aquatic Metabolism		kbacw	1000	days	Halfife
Anaerobic Aquatic Metabolism		kbacs	3500	days	Halfife
Aerobic Soil Metabolism	asm	1747	days	Halfife	
Hydrolysis:	pH 7	0	days	Half-life	
Method:	CAM	2	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm		
Application Rate:	TAPP	0.0637	kg/ha		
Application Efficiency:	APPEFF	0.95	fraction		
Spray Drift	DRFT	0.05	fraction of application rate applied to pond		
Application Date	Date	27-07	dd/mm or dd/mmm or dd-mm or dd-mmm		
Interval 1	interval	14	days	Set to 0 or delete line for single app.	
Record 17:	FILTRA				
	IPSCND				
	UPTKF				
Record 18:	PLVKRT				
	PLDKRT				
	FEXTRC	0.5			
Flag for Index Res. Run	IR	Pond			
Flag for runoff calc.	RUNOFF	none	none, monthly or total(average of entire run)		

PRZM environment: **MSsoybeanC.txt** modified Satday, 12 October 2002 at 17:07:44
EXAMS environment: **pond298.exv** modified Thuday, 29 August 2002 at 16:33:30
Metfile: w13893.dvf modified Wedday, 3 July 2002 at 09:06:20
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	1.613	1.604	1.58	1.384	1.029	0.2744
1962	2.16	2.15	2.123	2.107	2.102	1.586
1963	2.618	2.614	2.599	2.438	2.414	2.109
1964	3.516	3.511	3.485	3.318	3.212	2.72
1965	4.432	4.416	4.366	4.285	4.233	3.547
1966	4.754	4.742	4.702	4.64	4.633	4.2
1967	5.344	5.334	5.322	5.038	4.915	4.568
1968	6.962	6.94	6.855	6.771	6.742	5.498
1969	7.331	7.308	7.169	6.868	6.598	6.376
1970	7.484	7.471	7.449	7.384	7.31	7.004
1971	7.248	7.244	7.23	7.198	7.174	6.921
1972	8.42	8.404	8.363	8.282	8.202	7.169
1973	8.255	8.236	8.201	8.155	8.145	7.87
1974	8.071	8.066	8.048	8.01	7.978	7.694
1975	8.104	8.095	8.062	8.013	7.879	7.53
1976	9.156	9.137	9.092	8.996	8.858	7.986
1977	9.46	9.434	9.366	9.263	9.241	8.624
1978	9.761	9.746	9.694	9.24	9.038	8.771
1979	9.616	9.607	9.572	9.506	9.458	9.2
1980	9.729	9.718	9.685	9.64	9.596	9.187
1981	10.94	10.91	10.85	10.72	10.36	9.391
1982	10.6	10.58	10.55	10.47	10.45	10.11

1983	10.54	10.53	10.51	10.38	10.35	10.01
1984	10.42	10.42	10.39	10.33	10.29	9.907
1985	9.84	9.837	9.824	9.794	9.762	9.409
1986	11.3	11.29	11.2	10.96	10.29	9.268
1987	11.48	11.46	11.42	11.15	10.7	10.31
1988	11.26	11.25	11.21	11.14	11.09	10.68
1989	11.49	11.47	11.41	11.37	11.33	10.64
1990	11.51	11.49	11.42	11.32	11.28	10.88

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.032258064516129	11.51	11.49	11.42	11.37	11.33	10.88
0.0645161290322581	11.49	11.47	11.42	11.32	11.28	10.68
0.0967741935483871	11.48	11.46	11.41	11.15	11.09	10.64
0.129032258064516	11.3	11.29	11.21	11.14	10.7	10.31
0.161290322580645	11.26	11.25	11.2	10.96	10.45	10.11
0.193548387096774	10.94	10.91	10.85	10.72	10.36	10.01
0.225806451612903	10.6	10.58	10.55	10.47	10.35	9.907
0.258064516129032	10.54	10.53	10.51	10.38	10.29	9.409
0.290322580645161	10.42	10.42	10.39	10.33	10.29	9.391
0.32258064516129	9.84	9.837	9.824	9.794	9.762	9.268
0.354838709677419	9.761	9.746	9.694	9.64	9.596	9.2
0.387096774193548	9.729	9.718	9.685	9.506	9.458	9.187
0.419354838709677	9.616	9.607	9.572	9.263	9.241	8.771
0.451612903225806	9.46	9.434	9.366	9.24	9.038	8.624
0.483870967741936	9.156	9.137	9.092	8.996	8.858	7.986
0.516129032258065	8.42	8.404	8.363	8.282	8.202	7.87
0.548387096774194	8.255	8.236	8.201	8.155	8.145	7.694
0.580645161290323	8.104	8.095	8.062	8.013	7.978	7.53
0.612903225806452	8.071	8.066	8.048	8.01	7.879	7.169
0.645161290322581	7.484	7.471	7.449	7.384	7.31	7.004
0.67741935483871	7.331	7.308	7.23	7.198	7.174	6.921
0.709677419354839	7.248	7.244	7.169	6.868	6.742	6.376
0.741935483870968	6.962	6.94	6.855	6.771	6.598	5.498
0.774193548387097	5.344	5.334	5.322	5.038	4.915	4.568
0.806451612903226	4.754	4.742	4.702	4.64	4.633	4.2
0.838709677419355	4.432	4.416	4.366	4.285	4.233	3.547
0.870967741935484	3.516	3.511	3.485	3.318	3.212	2.72
0.903225806451613	2.618	2.614	2.599	2.438	2.414	2.109
0.935483870967742	2.16	2.15	2.123	2.107	2.102	1.586
0.967741935483871	1.613	1.604	1.58	1.384	1.029	0.2744
0.1	11.462	11.443	11.39	11.149	11.051	10.607
					Average of yearly	
averages:	7.31464666666667					

Inputs generated by pe4.pl - 8-August-2003

Data used for this run:
Output File: flusbr
Metfile: w13893.dvf
PRZM scenario: MSsoybeanC.txt
EXAMS environment file: pond298.exv
Chemical Name: flutriafol

Description	Variable Name	Value	Units	Comments	
Molecular weight	mwt	301	g/mol		
Henry's Law Const.	henry	1.3E-11	atm-m^3/mol		
Vapor Pressure	vapr	3E-09	torr		
Solubility	sol	95	mg/L		
Kd	Kd		mg/L		
Koc	Koc	255	mg/L		
Photolysis half-life	kdp	0	days	Half-life	
Aerobic Aquatic Metabolism		kbacw	1000	days	Halfife
Anaerobic Aquatic Metabolism		kbacs	3500	days	Halfife
Aerobic Soil Metabolism	asm	1747	days	Halfife	
Hydrolysis:	pH 7	0	days	Half-life	
Method:	CAM	2	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm		
Application Rate:	TAPP	0.0637	kg/ha		
Application Efficiency:	APPEFF	0.95	fraction		
Spray Drift	DRFT	0.05	fraction of application rate applied to pond		
Application Date	Date	01-09	dd/mm or dd/mmm or dd-mm or dd-mmm		
Interval 1	interval	14	days	Set to 0 or delete line for single app.	
Record 17:	FILTRA				
	IPSCND				
	UPTKF				
Record 18:	PLVKRT				
	PLDKRT				
	FEXTRC	0.5			
Flag for Index Res. Run	IR	Pond			
Flag for runoff calc.	RUNOFF	none	none, monthly or total(average of entire run)		

Appendix B. SCI-GROW Print-out

SCIGROW - VERSION 2.3
ENVIRONMENTAL FATE AND EFFECTS DIVISION
OFFICE OF PESTICIDE PROGRAMS
U.S. ENVIRONMENTAL PROTECTION AGENCY
SCREENING MODEL FOR AQUATIC PESTICIDE EXPOSURE

SciGrow version 2.3
chemical:flutriafol
time is 11/25/2005 13:39:43

Application rate (lb/acre)	Number of applications	Total Use (lb/acre/yr)	K_{oc} (ml/g)	Soil Aerobic metabolism (days)
0.057	2.0	0.114	2.95E+02	1747.0

groundwater screening cond (ppb) = 5.83E-01

****

Appendix C. Identity of Endangered Avian and Mammalian Species Located in Soybean Producing Counties.

Species Details by State for Preliminary Assessment

Soybeans (176)

Minimum of 1 Acre.

Alabama (8 species)

	Group	Critical Habitat
BAT, GRAY	Mammal	No
BAT, INDIANA	Mammal	Yes
EAGLE, BALD	Bird	No
MOUSE, ALABAMA BEACH	Mammal	Yes
MOUSE, PERDIDO KEY BEACH	Mammal	Yes
PLOVER, PIPING	Bird	Yes
STORK, WOOD	Bird	No
WOODPECKER, RED-COCKADED	Bird	No

Arkansas (5 species)

	Group	Critical Habitat
BAT, GRAY	Mammal	No
BAT, INDIANA	Mammal	Yes
EAGLE, BALD	Bird	No
TERN, INTERIOR (POPULATION) LEAST	Bird	No
WOODPECKER, RED-COCKADED	Bird	No

Delaware (4 species)

	Group	Critical Habitat
EAGLE, BALD	Bird	No
PLOVER, PIPING	Bird	Yes
SQUIRREL, DELMARVA PENINSULA FOX	Mammal	No
WHALE, NORTHERN RIGHT	Mammal	Yes

Florida (12 species)

	Group	Critical Habitat
BAT, GRAY	Mammal	No
BAT, INDIANA	Mammal	Yes
EAGLE, BALD	Bird	No

JAY, FLORIDA SCRUB	Bird	No

KITE, EVERGLADE SNAIL	Bird	Yes
MANATEE, WEST INDIAN (FLORIDA)	Mammal	Yes
MOUSE, CHOCTAWHATCHEE BEACH	Mammal	Yes
MOUSE, PERDIDO KEY BEACH	Mammal	Yes
PLOVER, PIPING	Bird	Yes
STORK, WOOD	Bird	No
WHALE, NORTHERN RIGHT	Mammal	Yes
WOODPECKER, RED-COCKADED	Bird	No

Georgia (8 species)

	Group	Critical Habitat
BAT, GRAY	Mammal	No
BAT, INDIANA	Mammal	Yes
EAGLE, BALD	Bird	No
MANATEE, WEST INDIAN (FLORIDA)	Mammal	Yes
PLOVER, PIPING	Bird	Yes
STORK, WOOD	Bird	No
WARBLER (WOOD), KIRTLAND'S	Bird	No
WOODPECKER, RED-COCKADED	Bird	No

Illinois (5 species)

	Group	Critical Habitat
BAT, GRAY	Mammal	No
BAT, INDIANA	Mammal	Yes
EAGLE, BALD	Bird	No
PLOVER, PIPING	Bird	Yes
TERN, INTERIOR (POPULATION) LEAST	Bird	No

Indiana (4 species)

	Group	Critical Habitat
BAT, GRAY	Mammal	No
BAT, INDIANA	Mammal	Yes
EAGLE, BALD	Bird	No
TERN, INTERIOR (POPULATION) LEAST	Bird	No

Iowa (4 species)

	Group	Critical Habitat
BAT, INDIANA	Mammal	Yes
EAGLE, BALD	Bird	No
PLOVER, PIPING	Bird	Yes
TERN, INTERIOR (POPULATION) LEAST	Bird	No

Kansas (7 species)

	Group	Critical Habitat
BAT, GRAY	Mammal	No
CRANE, WHOOPING	Bird	Yes
EAGLE, BALD	Bird	No
FERRET, BLACK-FOOTED	Mammal	No
PLOVER, MOUNTAIN	Bird	No
PLOVER, PIPING	Bird	Yes
TERN, INTERIOR (POPULATION) LEAST	Bird	No

Kentucky (6 species)

	Group	Critical Habitat
BAT, GRAY	Mammal	No
BAT, INDIANA	Mammal	Yes
BAT, VIRGINIA BIG-EARED	Mammal	Yes
EAGLE, BALD	Bird	No
TERN, INTERIOR (POPULATION) LEAST	Bird	No
WOODPECKER, RED-COCKADED	Bird	No

Louisiana (8 species)

	Group	Critical Habitat
BEAR, AMERICAN BLACK	Mammal	No
BEAR, LOUISIANA BLACK	Mammal	Yes
EAGLE, BALD	Bird	No
PELICAN, BROWN	Bird	No
PLOVER, PIPING	Bird	Yes
TERN, CALIFORNIA LEAST	Bird	No
TERN, INTERIOR (POPULATION) LEAST	Bird	No

WOODPECKER, RED-COCKADED	Bird	No

Maine (3 species)

	Group	Critical Habitat
EAGLE, BALD	Bird	No
LYNX, CANADA	Mammal	No
WHALE, NORTHERN RIGHT	Mammal	Yes

Maryland (5 species)

	Group	Critical Habitat
BAT, INDIANA	Mammal	Yes
EAGLE, BALD	Bird	No
PLOVER, PIPING	Bird	Yes
SQUIRREL, DELMARVA PENINSULA FOX	Mammal	No
WHALE, NORTHERN RIGHT	Mammal	Yes

Massachusetts (2 species)

	Group	Critical Habitat
EAGLE, BALD	Bird	No
WHALE, NORTHERN RIGHT	Mammal	Yes

Michigan (5 species)

	Group	Critical Habitat
BAT, INDIANA	Mammal	Yes
EAGLE, BALD	Bird	No
PLOVER, PIPING	Bird	Yes
WARBLER (WOOD), KIRTLAND'S	Bird	No
WOLF, GRAY	Mammal	Yes

Minnesota (3 species)

	Group	Critical Habitat
EAGLE, BALD	Bird	No
PLOVER, PIPING	Bird	Yes
WOLF, GRAY	Mammal	Yes

Mississippi (6 species)

	Group	Critical Habitat
BEAR, LOUISIANA BLACK	Mammal	Yes

CRANE, MISSISSIPPI SANDHILL	Bird	Yes
EAGLE, BALD	Bird	No
PELICAN, BROWN	Bird	No
TERN, INTERIOR (POPULATION) LEAST	Bird	No
WOODPECKER, RED-COCKADED	Bird	No

Missouri (5 species)

	Group	Critical Habitat
BAT, GRAY	Mammal	No
BAT, INDIANA	Mammal	Yes
EAGLE, BALD	Bird	No
PLOVER, PIPING	Bird	Yes
TERN, INTERIOR (POPULATION) LEAST	Bird	No

Nebraska (5 species)

	Group	Critical Habitat
CRANE, WHOOPING	Bird	Yes
EAGLE, BALD	Bird	No
FERRET, BLACK-FOOTED	Mammal	No
PLOVER, PIPING	Bird	Yes
TERN, INTERIOR (POPULATION) LEAST	Bird	No

New Jersey (4 species)

	Group	Critical Habitat
BAT, INDIANA	Mammal	Yes
EAGLE, BALD	Bird	No
PLOVER, PIPING	Bird	Yes
WHALE, NORTHERN RIGHT	Mammal	Yes

New York (4 species)

	Group	Critical Habitat
BAT, INDIANA	Mammal	Yes
EAGLE, BALD	Bird	No
PLOVER, PIPING	Bird	Yes
WHALE, NORTHERN RIGHT	Mammal	Yes

North Carolina (11 species)

	Group	Critical Habitat
BAT, INDIANA	Mammal	Yes
CAHOW	Bird	No
EAGLE, BALD	Bird	No
MANATEE, WEST INDIAN (FLORIDA)	Mammal	Yes
PLOVER, PIPING	Bird	Yes
SQUIRREL, CAROLINA NORTHERN FLYING	Mammal	No
STORK, WOOD	Bird	No
TERN, ROSEATE	Bird	No
WHALE, NORTHERN RIGHT	Mammal	Yes
WOLF, RED	Mammal	No
WOODPECKER, RED-COCKADED	Bird	No

North Dakota (4 species)

	Group	Critical Habitat
CRANE, WHOOPING	Bird	Yes
EAGLE, BALD	Bird	No
PLOVER, PIPING	Bird	Yes
TERN, INTERIOR (POPULATION) LEAST	Bird	No

Ohio (3 species)

	Group	Critical Habitat
BAT, INDIANA	Mammal	Yes
EAGLE, BALD	Bird	No
PLOVER, PIPING	Bird	Yes

Oklahoma (10 species)

	Group	Critical Habitat
BAT, GRAY	Mammal	No
BAT, INDIANA	Mammal	Yes
BAT, OZARK BIG-EARED	Mammal	No
CRANE, WHOOPING	Bird	Yes
CURLEW, ESKIMO	Bird	No
EAGLE, BALD	Bird	No

PLOVER, PIPING	Bird	Yes
TERN, INTERIOR (POPULATION) LEAST	Bird	No
VIREO, BLACK-CAPPED	Bird	No
WOODPECKER, RED-COCKADED	Bird	No

Pennsylvania (4 species)

	Group	Critical Habitat
BAT, INDIANA	Mammal	Yes
EAGLE, BALD	Bird	No
PLOVER, PIPING	Bird	Yes
SQUIRREL, DELMARVA PENINSULA FOX	Mammal	No

South Carolina (7 species)

	Group	Critical Habitat
EAGLE, BALD	Bird	No
MANATEE, WEST INDIAN (FLORIDA)	Mammal	Yes
PLOVER, PIPING	Bird	Yes
STORK, WOOD	Bird	No
WHALE, NORTHERN RIGHT	Mammal	Yes
WOLF, RED	Mammal	No
WOODPECKER, RED-COCKADED	Bird	No

South Dakota (5 species)

	Group	Critical Habitat
CRANE, WHOOPING	Bird	Yes
EAGLE, BALD	Bird	No
FERRET, BLACK-FOOTED	Mammal	No
PLOVER, PIPING	Bird	Yes
TERN, INTERIOR (POPULATION) LEAST	Bird	No

Tennessee (7 species)

	Group	Critical Habitat
BAT, GRAY	Mammal	No
BAT, INDIANA	Mammal	Yes
EAGLE, BALD	Bird	No
SQUIRREL, CAROLINA NORTHERN FLYING	Mammal	No

TERN, INTERIOR (POPULATION) LEAST	Bird	No
WOLF, RED	Mammal	No
WOODPECKER, RED-COCKADED	Bird	No

Texas (15 species)

	Group	Critical Habitat
BEAR, LOUISIANA BLACK	Mammal	Yes
CRANE, WHOOPING	Bird	Yes
CURLEW, ESKIMO	Bird	No
EAGLE, BALD	Bird	No
FALCON, NORTHERN APLOMADO	Bird	No
JAGUARUNDI, Gulf Coast	Mammal	No
OCELOT	Mammal	No
PELICAN, BROWN	Bird	No
PLOVER, MOUNTAIN	Bird	No
PLOVER, PIPING	Bird	Yes
PRAIRIE-CHICKEN, ATTWATER'S GREATER	Bird	No
TERN, INTERIOR (POPULATION) LEAST	Bird	No
VIREO, BLACK-CAPPED	Bird	No
WARBLER (WOOD), GOLDEN-CHEEKED	Bird	No
WOODPECKER, RED-COCKADED	Bird	No

Vermont (2 species)

	Group	Critical Habitat
BAT, INDIANA	Mammal	Yes
EAGLE, BALD	Bird	No

Virginia (7 species)

	Group	Critical Habitat
BAT, INDIANA	Mammal	Yes
BAT, VIRGINIA BIG-EARED	Mammal	Yes
EAGLE, BALD	Bird	No
PLOVER, PIPING	Bird	Yes
SQUIRREL, DELMARVA PENINSULA FOX	Mammal	No
WHALE, NORTHERN RIGHT	Mammal	Yes

WOODPECKER, RED-COCKADED	Bird	No

West virginia (5 species)

	Group	Critical Habitat
BAT, GRAY	Mammal	No
BAT, INDIANA	Mammal	Yes
BAT, VIRGINIA BIG-EARED	Mammal	Yes
EAGLE, BALD	Bird	No
SQUIRREL, VIRGINIA NORTHERN FLYING	Mammal	No

Wisconsin (3 species)

	Group	Critical Habitat
EAGLE, BALD	Bird	No
WARBLER (WOOD), KIRTLAND'S	Bird	No
WOLF, GRAY	Mammal	Yes