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WASHINGTON D.C., 20460

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

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MEMORANDUM

DATE: May 02, 2005

SUBJECT: Tier II Estimated Environmental Concentrations of Cypermethrin for the Use in the Human Health Risk Assessment.

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This memo presents the Estimated Surface Drinking Water Concentrations and Estimated Ground Water Concentrations (EDWCs) for CYPERMETHRIN, calculated using the Tier 2 aquatic model PRZM/EXAMS and the Tier 1 aquatic model SCI-GROW, respectively, for use in the human health risk assessment.

The Estimated Drinking Water Concentrations (EDWCs) for cypermethrin were calculated based on a maximum application rate of 0.6 lb a.i./A/season. The acute drinking water concentration in surface water is 1.04 ppb of cypermethrin. The cancer/chronic drinking water concentration is 0.013 ppb, using the NC cotton scenario. These values represent the mean value over a 30-year period. Various other scenarios were also explored (CA, MS and TX cotton, CA onion and CA lettuce), but they consistently yielded lower EDWCs. The SCI-GROW generated EDWC (for cotton or lettuce, highest application rate) is 0.0036 ppb of cypermethrin, which is recommended for use, both for acute and chronic exposures.

1. Introduction

Cypermethrin is a pyrethroid insecticide with both agricultural and non agricultural applications. For agricultural uses in the United States, cypermethrin is predominantly used to control pests on cotton, lettuce, pecans and onions, with the predominant use being cotton (80% of the total agricultural usage). It may be used alone or in conjunction with organophosphate pesticides to control pests such as budworm and bollworm populations on cotton and worms and aphids on lettuce. Application rates and the timing of these applications vary by crop type. Non agricultural uses of cypermethrin include pest management inside greenhouses, food processing, storage, and dairy facilities (non contact food uses only), wood treatment applications, animal kennels, commercial storage facilities, automobile and taxi services, and applications to drainage systems.

Cypermethrin is expected to have little mobility in soil surfaces and leaching into groundwater is not expected to be an important environmental fate process (mean Koc=141,700). Volatilization is not expected to be an important transport process since cypermethrin has a relatively low vapor pressure and Henry's Law constant ($2.5x10^{-9}$ mm Hg and $3.4x10^{-7}$ Atm-m^3/mole, respectively). Cypermethrin is moderately persistent in the environment and degrades through a combination of biotic and abiotic mechanisms. Cypermethrin hydrolyzes slowly at acidic and neutral pH, but degrades in a matter of days under alkaline conditions. Cypermethrin is more light stable than the first or second generation pyrethroids like allethrin and resmethrin, but still undergoes photolysis in water, with half-lives of about a month or more in distilled water (half-life 36.2 days). The rate of photolysis appears to be enhanced in natural waters (which contain photosensitizing agents like humic and fulvic acids), where the accelerated degradation results in half-lives of a few days or less. Under both aerobic and anaerobic soil metabolism conditions, cypermethrin biodegrades relatively slowly, with half-lives on the order of about 2 months, but in aquatic metabolism conditions, it biodegrades more rapidly, with half-lives on the order of one to two weeks. The primary degradation products of cypermethrin are cis- and trans-DCVA [(±)cis- or trans-3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropane carboxylic acid], 3-phenoxybenzaldehyde, and 3-PBA [3-phenoxybenzoic acid]. They result from cleavage of the ester linkage of the cypermethrin molecule.

Estimated Drinking Water Concentrations (EDWC) were calculated for groundwater and surface water utilizing the tier 1 aquatic model SCI-GROW, and tier 2 aquatic model PRZM/EXAMS, respectively.

2. SCI-GROW

The tier 1 aquatic model SCI-GROW was employed to estimate levels of cypermethrin that may potentially reach groundwater. SCI-GROW is a screening model which is used to estimate pesticide concentrations in vulnerable ground water. Pesticide concentrations estimated by SCI-GROW represent conservative or high-end exposure values because the model is based on ground-water monitoring studies which were conducted by applying pesticides at maximum allowed rates and frequency, to vulnerable sites (i.e., shallow aquifers, sandy, permeable soils, and substantial rainfall and/or irrigation to maximize leaching). In most cases, the majority of the use

areas will have ground water that is less vulnerable to contamination than the areas used to derive the SCI-GROW estimate. The SCI-GROW input parameters for cypermethrin are shown in Table 1. The SCI-GROW output file is shown in Appendix C.

Table 1. SCI-GROW Input Parameters and Estimated Environmental Concentration of Cypermethrin in Groundwater

PARAMETER	VALUE	SOURCE
Application rate (lbs a.i./A)	0.1	Product Label: Ammo 2.5 EC (EPA Reg. No. 279-3027), and Mustang (EPA Reg. No. 279-3126)
Number of applications	6	Product Label: Ammo 2.5 EC (EPA Reg. No. 279-3027), and Mustang (EPA Reg. No. 279-3126)
K_{oc}	20,800	MRID 42129002 and 42129003 (lowest value, there is greater than three-fold variation among values)
Soil aerobic half-life (days)	60.2	MRID 42156601
Estimated Groundwater concentration (ppb)	**0.0036**	Output value from SCI-GROW

For the SCI-GROW model, if the K_{oc} range has greater than 3-fold variation in the values, the lowest value is employed. It is also noted that estimated concentrations of chemicals with K_{oc} values greater than 9995 mL/g are beyond the scope of the regression data used in SCI-GROW development. The maximum application rate for cypermethrin of 0.1 lbs a.i./A for six applications per season was chosen. This maximum seasonal application rate is representative of various crops such as cotton and lettuce, considered in this assessment.

3. PRZM/EXAMS Drinking Water Concentrations

The tier 2 linked model PRZM/EXAMS was employed to calculate surface water concentrations (EDWCs) of cypermethrin in an index reservoir, which is used for assessment of vulnerable surface drinking water sources. The Index Reservoir is intended as a drop-in replacement for the standard pond for use in drinking water assessments. It is used in a manner similar to the standard pond except that flow rates are calibrated to be consistent with local weather conditions. The morphology of the reservoir and its watershed are designed to correspond with those of Shipman City Lake, a small reservoir in Illinois selected to represent small runoff-vulnerable drinking water surface supplies in agricultural areas. It is noted that the surface water concentrations generated from EXAMS were multiplied by Percent Crop Area (PCA) factors. In 1999, EFED proposed using PCA factors in pesticide exposure assessments to account for the fact that a watershed of

sufficient size to supply a drinking water source is not likely to be devoted entirely to growing crops (EPA 2003a). Generally a PCA factor of 0.87 is employed in drinking water assessments unless the assessment is for a crop for which there is a refined PCA estimate. In this Drinking Water Assessment, the EDWCs were obtained by multiplication of the output concentration of PRZM/EXAMS by 0.20 for the cotton scenarios and 0.87 for the CA onion and CA lettuce crop scenarios. The PRZM/EXAMS input parameters are shown in Tables 2 and 3. They were selected according to current EFED guidelines for the selection of input parameters for aquatic models. The output files from the PRZM/EXAMS runs are provided in Appendix C.

Table 2. PRZM/EXAMS Input Parameters for Cypermethrin used in the Drinking Water Assessment.

PARAMETER	VALUE	SOURCE
Maximum Individual Application Rate/ Number of Applications Per Season/ Minimum Interval Between Applications/ Application Date	Refer to Table 3 for details.	Crop specific. According to the label and, application date according to common agricultural practices.
Aerobic soil metabolism	62 days	MRID 42156601 (90% C.L. on the mean, n = 2 observations)
K_{oc}	141,700	MRID 42129002 and 42129003 (mean value, n = 4)
Henry's law constant	3.4×10^{-7} atm-m^3/mol	Laskowski (2002)
Aerobic Aquatic Metabolism	11.3 days	MRID 44876106 (90% C.L. on the mean, n = 2 observations)
Anaerobic Aquatic Metabolism	19.3 days	MRID 44876105 (90% C.L. on the mean, n = 2 observations)
Aqueous photolysis	36.2 days	MRID 42395701
Hydrolysis half-life (days) pH 5 pH 7 pH 9	stable stable 1.90 days	MRID 42620501
Molecular weight	416.3 g/mole	Laskowski (2002)
Solubility (WSOL)	0.040 ppm	Laskowski (2002) (solubility x 10)
Vapor pressure (VP)	2.5×10^{-9} mm Hg	Laskowski (2002)
PLDKRT (foliage pesticide rate constant)	0.13 $days^{-1}$	Willis and McDowell 1987
FEXTRC (foliar extraction)	0.5	EFED Model Input Guidance, Version II (2002)

Table 2. PRZM/EXAMS Input Parameters for Cypermethrin used in the Drinking Water Assessment.		
PARAMETER	VALUE	SOURCE
FILTRA (filtration parameter; required if CAM set to 3)	NA	--
PLVKRT (pesticide decay rate on plant foliage)	0/day	EFED Model Input Guidance, Version II (2002)
CAM (chemical application method)	2	Reflects foliar application
UPTKF (plant uptake factor)	0	EFED Model Input Guidance, Version II (2002)
IPSCND	1	Surface Applied
Application efficiency	0.95	EFED Model Input Guidance, Version II (2002)
spray drift	0.16	EPA (2003a). Default used for Drinking Water Assessments for aerial applications
PCA	Cotton - 0.20 Lettuce and Onion - 0.87	EPA (2003a).

Four PRZM scenarios were modeled for cotton crop usage : California, Mississippi, North Carolina and Texas. Each of these were modeled using the same application rates and use patterns. The California scenario is based on data from Fresno County in the Central Valley region. The Mississippi scenario arises from Yazoo County. The North Carolina PRZM scenario is representative of the Piedmont/Coastal Plain region. The Texas scenario is typically planted in the spring with crop maturity occurring roughly 4 months after the planting date. While late season planting can occur up to June in many southern states, it is not advisable to begin planting after mid May because of the steep decline in yield (the best yields usually occur with early season planting, optimal soil temperature and moisture and air temperature). Harvest typically occurs from September 1, through December. It is not advisable to use pyrethroid insecticides on cotton crops prior to July 1 unless infestations are high in order to avoid insect resistence later in the season (Roof 2004).

The field used to represent onion production in California is located in Kern County in the San Joaquin Valley, although onion production areas are quite extensive (San Joaquin, Coastal-Intermediate Region, Imperial Valley, southern and central coastal regions, the high desert areas of Los Angeles County and the northern mountain valleys). Bulb onions are planted from September through May and harvesting begins in April or May and completed by September.

Only one validated PRZM scenario currently exists for lettuce (California). Lettuce is a year-

round crop in California, so the application timing of cypermethrin can vary (Jackson et.al. 1996).

Table 3. Crop Usage Patterns for Cypermethrin on Cotton, Onions, and Lettuce[1]				
Crop or Crop Group	**Maximum Individual Application Rate (lb a.i./A)**	**Number of Applications per season**	**Minimum Application Interval (days)**	**Application Date (typical agricultural practices)**
Cotton	0.1 (0.112 kg/ha)	6	3	July 1st
Onion	0.1 (0.112 kg/ha)	5	7	May 10th
Lettuce	0.1 (0.112 kg/ha)	6	7	August 1st
(1). Data obtained from label for Ammo 2.5 EC (EPA Reg. No. 279-3027).				

EDWCs are summarized in Table 4.

Table 4. EDWC for Cypermethrin (ppb or μg/L) Obtained from PRZM/EXAMS.		
Site and Crop	**Peak**	**Annual Average (Cancer/Chronic)**
California[a] Cotton	0.12	0.003
Mississippi[a] Cotton	0.47	0.009
North Carolina[a] Cotton	**1.04**	**0.013**
Texas[a] Cotton	0.24	0.005
California[b] Onion	0.45	0.013
California[b] Lettuce	0.60	0.027
a. PRZM/EXAMS EDWC multiplied by 0.20 (PCA for cotton). b. PRZM/EXAMS EDWC multiplied by 0.87 (PCA for other crops).		

Appendix A. Background Information on SCI-GROW and PRZM/ EXAMS, and PRZM Scenarios

BACKGROUND INFORMATION ON SCI-GROW

SCI-GROW V.2.3 provides a groundwater screening exposure value to be used in determining the potential risk to human health from drinking water contaminated with the pesticide. Since the SCI-GROW concentrations are likely to be approached in only a very small percentage of drinking water sources, i.e., highly vulnerable aquifers, it is not appropriate to use SCI-GROW for national or regional exposure estimates.

SCI-GROW estimates likely groundwater concentrations if the pesticide is used at the maximum allowable rate in areas where groundwater is exceptionally vulnerable to contamination. In most cases, a large majority of the use area will have groundwater that is less vulnerable to contamination than the areas used to derive the SCI-GROW estimate.

Estimated concentrations of chemicals with K_{OC} values greater than 9995 ml/g are beyond the scope of the regression data used in SCI-GROW development. If there are concerns for such chemicals, a higher tier groundwater exposure assessment should be considered, regardless of the concentration returned by SCI-GROW.

BACKGROUND INFORMATION ON PRZM/EXAMS

The Tier II aquatic model employs PRZM (Pesticide Root Zone Model; version 3.12 Beta compiled May 24, 2001) and EXAMS (Exposure Analysis Modeling System; version 2.98.04 compiled November 12, 2002). PRZM simulates processes such like runoff and erosion from an agricultural field on a daily time step. The runoff and erosion flux output data from PRZM are used as chemical loadings to the EXAMS surface water program in order to predict the EECs. A graphical user interface (pe4v01.pl) developed by the EPA (http://www.epa.gov/oppefed1/models/water) was used to facilitate inputting chemical and use specific parameters into the appropriate PRZM input files (inp) and EXAMS chemical files.

PRZM is a one-dimensional, dynamic, compartmental model that can be used to simulate chemical movement in unsaturated soil systems within and immediately below the plant root zone. It has two major components: hydrology (and hydraulics) and chemical transport. The hydrologic component for calculating runoff and erosion is based on the Soil Conservation Service curve number technique and the Universal Soil Loss Equation. Evapotranspiration is estimated either directly from pan evaporation data, or based on an empirical formula. Water movement is simulated by the use of generalized soil parameters, including field capacity, wilting point, and saturation water content.

The chemical transport component can simulate pesticides or other chemicals. For pesticides, the transport component can simulate pesticide application on the soil or on the plant foliage. Biodegradation can also be considered in the root zone. Dissolved, adsorbed, and vapor-phase

concentrations in the soil are estimated by simultaneously considering the processes of pesticide uptake by plants, surface runoff, erosion, decay, volatilization, foliar washoff, advection, dispersion, and retardation. For nitrogen, simulation of surface applications, atmospheric deposition, and septic effluent discharge may all be simulated.

EXAMS is a model that has a set of process modules that link fundamental chemical properties to limnological processes that control the kinetics and transport of chemicals in aquatic systems. It provides facilities for steady state or long-term evaluation of chronic chemical discharges, initial-value approaches for studying short-term contaminant releases, and full kinetic simulations that allow for monthly variation in mean climatological factors, and changes in contaminant loadings on daily time scales. It is fairly and relatively complex model that requires more input variables, ranging from hydro-geological and weather data to pesticide physicochemical properties, mobility coefficients, and degradation rate constants in the aqueous and sediment phases.

PRZM CROP SCENARIOS:

Four PRZM scenarios exist for cotton crop usage : California, Mississippi, North Carolina and Texas. Each of these were modeled using the same application rates and use patterns. The California scenario is based on data from Fresno County in the Central Valley region using a Twisselman clay as the representative soil for this region. This soil is a fine, mixed, calcareous, thermic Typic Torriorthents of hydrologic group C. The Mississippi scenario arises from Yazoo County and uses a Loring silt loam as the representative soil. Loring silt loam is a fine-silty, mixed, active, thermic, Qxyaquic Fragiudalfs of hydrologic group C. The representative soil in the North Carolina PRZM scenario is a Boswell fine sandy loam of hydrologic group D, characteristic of the Piedmont/Coastal Plain region. The soil selected to simulate the Texas scenario is a Crockett fine sandy loam. Crockett fine sandy loam is a fine, smectitic, thermic Udertic Paleustalfs of hydrologic group C. Since cotton growth requires a relatively long period of warm temperatures (190-210 days at temperatures of 60 ^{o}F and above), it is typically planted in the spring with crop maturity occurring roughly 4 months after the planting date. While late season planting can occur up to June in many southern states, it is not advisable to begin planting after mid May because of the steep decline in yield (the best yields usually occur with early season planting, optimal soil temperature and moisture and air temperature). Harvest typically occurs from September 1, through December. It is not advisable to use pyrethroid insecticides on cotton crops prior to July 1 unless infestations are high in order to avoid insect resistence later in the season (Roof 2004).

The field used to represent onion production in California is located in Kern County in the San Joaquin Valley, although onion production areas are quite extensive (San Joaquin, Coastal-Intermediate Region, Imperial Valley, southern and central coastal regions, the high desert areas of Los Angeles County and the northern mountain valleys). According to the 1997 Census of Agriculture, California is the major producer of onions for the market. Bulb onions are planted from September through May and harvesting begins in April or May and completed by September. Onions are cools season, biennial plants that are commercially grown as an annual. Plant canopy can approach 100 percent in some narrow row fields grown under drip irrigation. Irrigation is required to avoid seed or plant dry out. Onions can grow on a wide range of soils.

The soil selected to represent the field is Ciervo clay. Ciervo clay, is a fine, semetic, thermic Vertic Haplocambids. These soils are often used for onion and other truck crop production under irrigation. The Ciervo clay has very slow permeability. Ciervo clay is a Hydrologic Group D soil.

Only one validated PRZM scenario currently exists for lettuce (California). The representative soil type is a Placentia sandy loam (hydrologic Group D). Lettuce is a year-round crop in California, so the application timing of cypermethrin can vary (Jackson et al. 1996). Lettuce is usually planted at depths of approximately 1/8 to 1/4 inches primarily on 40-inch raised beds with 2 seedlines per bed. For a midsummer planting, the harvest usually begins 70-80 days later and cypermethrin is typically foliar applied as needed following emergence.

Appendix B. References

EPA 2003a. Use of Regional Percent Crop Area Factors in Refined Drinking Water Assessments. US EPA Office of Pesticide Programs (OPP) Environmental Fate and Effects Division (EFED) Water Quality Technical Team (WQTT) July 25, 2003

EPA 2003b. Pesticide Root Zone Model Field and Orchard Crop Scenario Metadata. February 06, 2003

Gorsuch CS. Clemson University Pest Management Handbook. Fruits and Nuts (last updated 3-11-2003). http://cufan.clemson.edu/pmguide/main.htm

Jackson L., Mayberry K., Laemmlen F., Koike S., Schulbach K., Chaney W. Iceberg lettuce production in California. Vegetable Research and Information Center Univ of California Div of Agriculture and Natural Resources. Publication Number 7215 (1996).

Laskowski D.A. 2002. Physical and Chemical Properties of Pyrethroids. Rev. Environ. Contam. Toxicol. 174:49-170

NCFAP. 2003. National Center for Food and Agricultural Policy, National Pesticide Use Database. Information taken on February 28, 2005 from the website: http://www.ncfap.org/database/default.htm.

Roof ME. Clemson University Pest Management Handbook. Cotton Insect Control (last updated 5-26-2004). http://cufan.clemson.edu/pmguide/main.htm

Tomlin C. 1994. Pesticide Manual 10th edition. British Crop Protection Council. The Royal Society of Chemistry, Cambridge U.K.

Willis and McDowell 1987, as cited in Carsel, R.F., et.al., "PRZM-3, A Model for Predicting Pesticide and Nitrogen Fate in the Crop Root and Unsaturated Soil Zones: User's Manual for Release 3.0." National Exposure Research Laboratory USEPA, Athens, GA; AQUA TERRA Consultants, Mountain View, CA; and Waterborne Environmental, Inc., Leesburg, VA. p. 5-12.

Appendix C. Output files from SCI-GROW and PRZM/EXAMS

SCI-GROW

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                        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:Cypermethrin
 time is  5/ 2/2005  14:37:25
 ---------------------------------------------------------------------------
  Application      Number of       Total Use    Koc      Soil Aerobic
  rate (lb/acre)  applications   (lb/acre/yr)  (ml/g)   metabolism (days)
 ---------------------------------------------------------------------------
      0.100           6.0           0.600      2.08E+04       60.2
 ---------------------------------------------------------------------------
 groundwater screening cond (ppb) =   3.60E-03*
 *Estimated concentrations of chemicals with Koc values greater than 9995 ml/g
 are beyond the scope of the regression data used in SCI-GROW development.
 If there are concerns for such chemicals, a higher tier groundwater exposure
 assessment should be considered, regardless of the concentration returned
 by SCI-GROW.
 ***************************************************************************
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PRZM/EXAMS

Note: The output concentrations have **not** been adjusted by the PCA factor in these files. The adjustment is reflected in table 4

Cotton California

```
stored as CottonCA.out
Chemical: Cypermethrin
PRZM environment: CAcottonC.txt     modified Friday, 6 December 2002 at
06:50:06
EXAMS environment: ir298.exv  modified Thuday, 29 August 2002 at 10:34:12
Metfile: w93193.dvf     modified Wedday, 3 July 2002 at 04:04:24
Water segment concentrations (ppb)

Year  Peak  96 hr 21 Day      60 Day      90 Day      Yearly
1961  0.6109      0.3484      0.2565      0.0991      0.06724     0.01687
1962  0.6129      0.3508      0.2589      0.1006      0.06837     0.01731
1963  0.6166      0.3549      0.2622      0.1028      0.06998     0.01773
1964  0.6127      0.3504      0.2586      0.1004      0.06829     0.01724
1965  0.6149      0.3529      0.2606      0.1017      0.06925     0.01755
```

1966	0.6157	0.3539	0.2614	0.1019	0.06919	0.01751
1967	0.6085	0.3457	0.2548	0.09772	0.06605	0.01661
1968	0.6109	0.3484	0.257	0.09969	0.06785	0.01713
1969	0.6128	0.3506	0.2587	0.1005	0.06825	0.01748
1970	0.6093	0.3466	0.2555	0.09847	0.0668	0.01694
1971	0.611	0.3486	0.2571	0.09934	0.06738	0.01701
1972	0.6121	0.3497	0.2581	0.09996	0.06788	0.01715
1973	0.6133	0.3511	0.2592	0.1008	0.06857	0.0174
1974	0.6124	0.3501	0.2584	0.1002	0.06803	0.01717
1975	0.6161	0.3544	0.2618	0.1027	0.07004	0.01773
1976	0.6148	0.3528	0.2605	0.1023	0.07011	0.01797
1977	0.6108	0.3483	0.2569	0.09921	0.06726	0.017
1978	0.6102	0.3476	0.2563	0.0988	0.06713	0.01693
1979	0.611	0.3485	0.2571	0.09938	0.06733	0.01688
1980	0.6087	0.3458	0.2549	0.09805	0.06642	0.01666
1981	0.6073	0.3443	0.2537	0.09711	0.06564	0.01646
1982	0.6129	0.3507	0.2588	0.1004	0.0683	0.01731
1983	0.6154	0.3536	0.2611	0.1016	0.06884	0.01743
1984	0.6034	0.3398	0.25	0.09496	0.06402	0.01595
1985	0.6052	0.3419	0.2517	0.09617	0.06512	0.01636
1986	0.611	0.3485	0.2571	0.09891	0.0669	0.01686
1987	0.6182	0.3567	0.2637	0.1034	0.07033	0.0177
1988	0.6054	0.3422	0.2519	0.09625	0.06509	0.01629
1989	0.6098	0.3472	0.256	0.09878	0.06705	0.01685
1990	0.608	0.3451	0.2543	0.09766	0.06612	0.01662

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.1	**0.61606**	0.35435	0.26176	0.10266	0.070034	0.017727

Average of yearly averages: **0.01707**

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

Data used for this run:
Output File: CottonCA
Metfile: w93193.dvf
PRZM scenario: CAcottonC.txt
EXAMS environment file: ir298.exv
Chemical Name: Cypermethrin

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	416.3	g/mol	
Henry's Law Const.	henry	3.4e-7	atm-m^3/mol	
Vapor Pressure	vapr	2.5e-9	torr	
Solubility	sol	0.04	mg/L	
Kd	Kd		mg/L	
Koc	Koc	141700	mg/L	
Photolysis half-life	kdp	36.2	days	Half-life
Aerobic Aquatic Metabolism	kbacw	11.3	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	19.3	days	Halfife
Aerobic Soil Metabolism	asm	62	days	Halfife
Hydrolysis: pH 5		0	days	Half-life
Hydrolysis: pH 7		0	days	Half-life
Hydrolysis: pH 9		1.9	days	Half-life
Method:	CAM	2	integer	See PRZM manual
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	0.112	kg/ha	
Application Efficiency:	APPEFF	0.95	fraction	
Spray Drift	DRFT	0.16	fraction of application rate applied to pond	
Application Date	Date	1-7	dd/mm or dd/mmm or dd-mm or dd-mmm	

```
Interval 1  interval    3     days  Set to 0 or delete line for single app.
Interval 2  interval    3     days  Set to 0 or delete line for single app.
Interval 3  interval    3     days  Set to 0 or delete line for single app.
Interval 4  interval    3     days  Set to 0 or delete line for single app.
Interval 5  interval    3     days  Set to 0 or delete line for single app.
Record 17:  FILTRA
      IPSCND      1
      UPTKF
Record 18:  PLVKRT
      PLDKRT      0.13
      FEXTRC      0.5
Flag for Index Res. Run IR    IR
Flag for runoff calc.   RUNOFF      total none, monthly or total(average of
entire run)
Write Benthic Porewater File? benthic     0
Write Benthic Sediment File?  benthicsed  0
```

Cotton Mississippi

```
stored as CottonMS.out
Chemical: Cypermethrin
PRZM environment: CAonionC.txt      modified Monday, 23 December 2002 at
05:48:48
EXAMS environment: ir298.exv  modified Thuday, 29 August 2002 at 10:34:12
Metfile: w03940.dvf     modified Wedday, 3 July 2002 at 04:05:46
Water segment concentrations (ppb)
```

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	1.294	0.8689	0.4102	0.2243	0.1601	0.04901
1962	0.7856	0.4131	0.2657	0.1317	0.1018	0.03352
1963	2.187	1.036	0.4336	0.1766	0.1212	0.03677
1964	1.24	0.5311	0.3216	0.1919	0.1415	0.05652
1965	2.26	1.176	0.3197	0.1456	0.1579	0.05247
1966	1.734	0.7583	0.2785	0.2056	0.1549	0.04914
1967	0.687	0.3941	0.3014	0.1571	0.1182	0.03941
1968	0.6447	0.3617	0.2586	0.1339	0.09727	0.03297
1969	1.509	0.6197	0.3031	0.181	0.1295	0.03999
1970	1.036	0.4287	0.2561	0.1404	0.1331	0.05081
1971	1.138	0.5153	0.335	0.1948	0.1612	0.05147
1972	0.6268	0.355	0.2627	0.1317	0.0973	0.03513
1973	0.6045	0.3406	0.2508	0.1086	0.08734	0.03431
1974	0.6383	0.3615	0.2591	0.1352	0.1185	0.04385
1975	3.933	1.602	0.5744	0.325	0.2379	0.07385
1976	0.8993	0.5919	0.3304	0.1707	0.1447	0.04671
1977	1.08	0.6076	0.3262	0.175	0.1371	0.04835
1978	0.9796	0.56	0.315	0.1313	0.09914	0.03721
1979	3.381	1.565	0.7158	0.3673	0.2747	0.08552
1980	0.612	0.3393	0.2636	0.1153	0.08078	0.03044
1981	1.287	0.6196	0.3348	0.1415	0.1139	0.03842
1982	2.043	0.9086	0.513	0.3084	0.216	0.07078
1983	1.08	0.4434	0.272	0.149	0.1118	0.04244
1984	1.492	0.7043	0.3354	0.1887	0.1363	0.05006
1985	2.36	0.9698	0.3074	0.2285	0.1714	0.05328
1986	1.327	0.5493	0.3526	0.1695	0.1274	0.04415
1987	0.6063	0.3427	0.2592	0.1366	0.09617	0.03237
1988	0.9502	0.5307	0.3062	0.1462	0.1057	0.04024
1989	0.8184	0.48	0.3186	0.1355	0.1048	0.04127
1990	0.6208	0.3517	0.2592	0.103	0.08958	0.03481

```
Sorted results
Prob. Peak  96 hr 21 Day      60 Day      90 Day      Yearly

0.1   2.35  1.162 0.50506     0.30041     0.21154     0.069354
                              Average of yearly averages:   0.0458423333333333

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

Data used for this run:
Output File: CottonMS
Metfile:    w03940.dvf
PRZM scenario:    CAonionC.txt
EXAMS environment file: ir298.exv
Chemical Name:    Cypermethrin
Description Variable Name     Value Units Comments
Molecular weight  mwt   416.3 g/mol
Henry's Law Const.      henry 3.4e-7      atm-m^3/mol
Vapor Pressure    vapr  2.5e-9      torr
Solubility  sol   0.04  mg/L
Kd    Kd          mg/L
Koc   Koc   141700      mg/L
Photolysis half-life    kdp   36.2  days  Half-life
Aerobic Aquatic Metabolism    kbacw 11.3  days  Halfife
Anaerobic Aquatic Metabolism  kbacs 19.3  days  Halfife
Aerobic Soil Metabolism asm   62    days  Halfife
Hydrolysis: pH 5  0     days  Half-life
Hydrolysis: pH 7  0     days  Half-life
Hydrolysis: pH 9  1.9   days  Half-life
Method:     CAM   2     integer     See PRZM manual
Incorporation Depth:    DEPI  0     cm
Application Rate: TAPP  0.112 kg/ha
Application Efficiency: APPEFF      0.95  fraction
Spray Drift DRFT  0.16  fraction of application rate applied to pond
Application Date  Date  1-7   dd/mm or dd/mmm or dd-mm or dd-mmm
Interval 1  interval    3     days  Set to 0 or delete line for single app.
Interval 2  interval    3     days  Set to 0 or delete line for single app.
Interval 3  interval    3     days  Set to 0 or delete line for single app.
Interval 4  interval    3     days  Set to 0 or delete line for single app.
Interval 5  interval    3     days  Set to 0 or delete line for single app.
Record 17:  FILTRA
      IPSCND      1
      UPTKF
Record 18:  PLVKRT
      PLDKRT      .13
      FEXTRC      0.5
Flag for Index Res. Run IR    IR
Flag for runoff calc.   RUNOFF      total none, monthly or total(average of
entire run)
Write Benthic Porewater File? benthic
Write Benthic Sediment File?  benthicsed
```

Cotton North Carolina

```
stored as CottonNC.out
Chemical: Cypermethrin
PRZM environment: NCcottonC.txt     modified Friday, 6 December 2002 at
08:14:40
```

EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 10:34:12
Metfile: w13722.dvf   modified Wedday, 3 July 2002 at 04:05:50
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	1.822	0.8207	0.3655	0.269	0.2069	0.05829
1962	2.846	1.274	0.7578	0.353	0.2549	0.0783
1963	1.125	0.494	0.2877	0.1376	0.09743	0.04555
1964	2.09	0.968	0.4298	0.275	0.238	0.07862
1965	2.719	1.323	0.5334	0.3374	0.2443	0.07185
1966	2.355	0.9852	0.4319	0.2559	0.1913	0.05691
1967	1.998	0.8431	0.3812	0.2716	0.2119	0.063
1968	3.412	1.608	0.6143	0.3001	0.2309	0.07346
1969	3.211	1.57	0.5946	0.3667	0.2779	0.0824
1970	2.937	1.317	0.6014	0.3466	0.2494	0.07206
1971	1.855	0.9675	0.4636	0.323	0.2495	0.0745
1972	2.971	1.419	0.6904	0.3872	0.2837	0.08212
1973	2.265	1.054	0.4831	0.3214	0.235	0.06792
1974	1.949	0.9601	0.3797	0.2457	0.1932	0.05781
1975	5.266	3.391	1.008	0.4438	0.32	0.08925
1976	1.786	0.7545	0.2605	0.1168	0.1261	0.04423
1977	1.448	0.6314	0.2886	0.2049	0.1745	0.05664
1978	5.485	2.272	0.6986	0.3195	0.2252	0.06654
1979	3.411	1.432	0.6556	0.3246	0.2565	0.07655
1980	1.348	0.5586	0.2685	0.1511	0.1383	0.04554
1981	2.625	1.114	0.5066	0.3323	0.2575	0.07694
1982	0.8976	0.3848	0.2617	0.1604	0.1161	0.04308
1983	0.6274	0.3517	0.2599	0.1095	0.07946	0.03825
1984	5.433	2.728	1.104	0.5139	0.3621	0.1022
1985	4.779	2.035	0.6108	0.3809	0.2769	0.07982
1986	1.824	0.9156	0.4323	0.342	0.2514	0.07123
1987	2.371	0.9961	0.371	0.1901	0.1816	0.0567
1988	1.435	0.6042	0.3041	0.1963	0.1802	0.05817
1989	2.823	1.287	0.5291	0.3507	0.2616	0.07916
1990	0.8369	0.4513	0.295	0.1372	0.096	0.04047

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.1	**5.2173**		2.2483	0.75188	0.38657	0.28312	0.082372

Average of yearly averages: **0.066252**

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

Data used for this run:
Output File: CottonNC
Metfile: w13722.dvf
PRZM scenario: NCcottonC.txt
EXAMS environment file: ir298.exv
Chemical Name: Cypermethrin

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	416.3	g/mol	
Henry's Law Const.	henry	3.4e-7	atm-m^3/mol	
Vapor Pressure	vapr	2.5e-9	torr	
Solubility	sol	0.04	mg/L	
Kd	Kd		mg/L	
Koc	Koc	141700	mg/L	
Photolysis half-life	kdp	36.2	days	Half-life
Aerobic Aquatic Metabolism	kbacw	11.3	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	19.3	days	Halfife

```
Aerobic Soil Metabolism asm   62    days  Halfife
Hydrolysis: pH 5  0     days  Half-life
Hydrolysis: pH 7  0     days  Half-life
Hydrolysis: pH 9  1.9   days  Half-life
Method:     CAM   2     integer     See PRZM manual
Incorporation Depth:    DEPI  0     cm
Application Rate: TAPP  0.112 kg/ha
Application Efficiency: APPEFF      0.95  fraction
Spray Drift DRFT  0.16  fraction of application rate applied to pond
Application Date  Date  1-7   dd/mm or dd/mmm or dd-mm or dd-mmm
Interval 1  interval    3     days  Set to 0 or delete line for single app.
Interval 2  interval    3     days  Set to 0 or delete line for single app.
Interval 3  interval    3     days  Set to 0 or delete line for single app.
Interval 4  interval    3     days  Set to 0 or delete line for single app.
Interval 5  interval    3     days  Set to 0 or delete line for single app.
Record 17:  FILTRA
      IPSCND      3
      UPTKF
Record 18:  PLVKRT
      PLDKRT      .13
      FEXTRC      0.5
Flag for Index Res. Run IR    IR
Flag for runoff calc.   RUNOFF      total none, monthly or total(average of
entire run)
Write Benthic Porewater File? benthic
Write Benthic Sediment File?  benthicsed
```

Cotton Texas

```
stored as CottonTX.out
Chemical: Cypermethrin
PRZM environment: TXcottonC.txt     modified Friday, 6 December 2002 at
08:25:18
EXAMS environment: ir298.exv  modified Thuday, 29 August 2002 at 10:34:12
Metfile: w13958.dvf     modified Wedday, 3 July 2002 at 04:06:24
Water segment concentrations (ppb)
```

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	1.577	0.8782	0.4497	0.1831	0.1439	0.03805
1962	1.133	0.4547	0.2521	0.1278	0.09677	0.02687
1963	0.6046	0.3411	0.251	0.09555	0.06487	0.01705
1964	0.6067	0.3434	0.2531	0.09779	0.0755	0.02353
1965	0.6073	0.3442	0.2536	0.0995	0.07863	0.02501
1966	0.6066	0.3434	0.2529	0.1351	0.09717	0.026
1967	0.6067	0.3435	0.2537	0.1036	0.08379	0.02615
1968	1.039	0.5805	0.3312	0.1303	0.09437	0.02719
1969	0.6044	0.3408	0.2509	0.126	0.08919	0.02477
1970	0.6084	0.3454	0.2546	0.09779	0.07011	0.02002
1971	0.8563	0.427	0.2516	0.1392	0.09671	0.02576
1972	0.6115	0.349	0.2642	0.1044	0.07122	0.02036
1973	0.9996	0.5834	0.3205	0.1256	0.1002	0.03466
1974	1.198	0.5005	0.254	0.1549	0.1141	0.03354
1975	0.6942	0.4443	0.2827	0.116	0.08549	0.02562
1976	0.7866	0.4442	0.3059	0.1208	0.09663	0.02871
1977	0.6061	0.3428	0.2524	0.09641	0.06923	0.01932
1978	0.6041	0.3405	0.2506	0.1138	0.08269	0.02342
1979	2.672	1.104	0.5084	0.2583	0.179	0.04727
1980	0.6012	0.3371	0.2478	0.09418	0.06786	0.01897

1981	0.6692	0.4145	0.2779	0.1068	0.0844	0.02623
1982	0.6038	0.3401	0.2503	0.09516	0.06434	0.01757
1983	1.098	0.4808	0.3043	0.1247	0.08769	0.02373
1984	0.6059	0.3425	0.2522	0.09644	0.06549	0.02177
1985	0.6443	0.3542	0.2625	0.1009	0.07352	0.02417
1986	0.6045	0.341	0.251	0.09583	0.07742	0.02613
1987	0.8617	0.3565	0.2732	0.1097	0.09496	0.02722
1988	0.6083	0.3458	0.2547	0.09938	0.06712	0.0176
1989	0.6061	0.3428	0.2525	0.1035	0.07118	0.01902
1990	0.8209	0.4617	0.2883	0.113	0.07683	0.02324

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.1	**1.1915**		0.58311	0.33013	0.15333	0.11271	0.034548

Average of yearly averages: **0.0252983333333333**

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

Data used for this run:
Output File: CottonTX
Metfile: w13958.dvf
PRZM scenario: TXcottonC.txt
EXAMS environment file: ir298.exv
Chemical Name: Cypermethrin

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	416.3	g/mol	
Henry's Law Const.	henry	3.4e-7	atm-m^3/mol	
Vapor Pressure	vapr	2.5e-9	torr	
Solubility	sol	0.04	mg/L	
Kd	Kd		mg/L	
Koc	Koc	141700	mg/L	
Photolysis half-life	kdp	36.2	days	Half-life
Aerobic Aquatic Metabolism	kbacw	11.3	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	19.3	days	Halfife
Aerobic Soil Metabolism	asm	62	days	Halfife
Hydrolysis: pH 5		0	days	Half-life
Hydrolysis: pH 7		0	days	Half-life
Hydrolysis: pH 9		1.9	days	Half-life
Method:	CAM	2	integer	See PRZM manual
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	0.112	kg/ha	
Application Efficiency:	APPEFF	0.95	fraction	
Spray Drift	DRFT	0.16	fraction of application rate applied to pond	
Application Date	Date	1-7	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	3	days	Set to 0 or delete line for single app.
Interval 2	interval	3	days	Set to 0 or delete line for single app.
Interval 3	interval	3	days	Set to 0 or delete line for single app.
Interval 4	interval	3	days	Set to 0 or delete line for single app.
Interval 5	interval	3	days	Set to 0 or delete line for single app.

Record 17: FILTRA
IPSCND 1
UPTKF
Record 18: PLVKRT
PLDKRT .13
FEXTRC 0.5
Flag for Index Res. Run IR IR
Flag for runoff calc. RUNOFF total none, monthly or total(average of entire run)

```
Write Benthic Porewater File? benthic
Write Benthic Sediment File?  benthicsed
```

California Onions

```
stored as Cypermethrin.out
Chemical: Cypermethrin
PRZM environment: CAonion0C.txt     modified Tueday, 8 June 2004 at 12:01:56
EXAMS environment: ir298.exv  modified Thuday, 29 August 2002 at 15:34:12
Metfile: w23155.dvf     modified Wedday, 3 July 2002 at 09:04:20
Water segment concentrations (ppb)

Year  Peak  96 hr 21 Day      60 Day      90 Day      Yearly
1961  0.5165      0.2212      0.1443      0.08728     0.05929     0.01474
1962  0.5173      0.2224      0.146 0.08886     0.06069     0.0152
1963  0.5178      0.2231      0.1462      0.08936     0.06143     0.01545
1964  0.5175      0.2223      0.1461      0.08905     0.06087     0.01516
1965  0.5181      0.2239      0.1464      0.08958     0.06154     0.01545
1966  0.5158      0.2193      0.1435      0.08722     0.05968     0.01505
1967  0.5175      0.2227      0.1458      0.08897     0.06077     0.01522
1968  0.515 0.219 0.1429      0.08647     0.05872     0.01463
1969  0.5156      0.2197      0.1429      0.08675     0.05911     0.01471
1970  0.5143      0.2166      0.1413      0.08545     0.05797     0.01449
1971  0.5184      0.2244      0.1477      0.0893      0.0608      0.01516
1972  0.5444      0.2289      0.1448      0.08722     0.05937     0.01479
1973  0.513 0.2146      0.1395      0.08411     0.05709     0.01423
1974  0.5145      0.2175      0.1418      0.0858      0.05832     0.01492
1975  0.5145      0.2175      0.1419      0.08583     0.0584      0.01462
1976  0.5144      0.217 0.1413      0.08549     0.05818     0.01447
1977  0.516 0.2202      0.1434      0.08672     0.05883     0.01513
1978  0.515 0.218 0.1424      0.08629     0.0587      0.01495
1979  0.5136      0.2158      0.1405      0.08481     0.05763     0.01432
1980  0.5184      0.2238      0.1471      0.08993     0.0616      0.01532
1981  0.514 0.2171      0.141 0.08507     0.05767     0.01438
1982  0.5145      0.2176      0.1415      0.08574     0.05833     0.01457
1983  0.5171      0.2215      0.1453      0.08861     0.06085     0.01572
1984  0.5164      0.2212      0.1441      0.08772     0.05989     0.01493
1985  0.5156      0.2203      0.1439      0.08719     0.05931     0.01489
1986  0.516 0.2197      0.1439      0.08741     0.05976     0.01495
1987  0.5155      0.2187      0.1431      0.08686     0.05955     0.01523
1988  0.5173      0.2216      0.1457      0.08876     0.06053     0.01509
1989  0.5166      0.2205      0.1447      0.08808     0.0602      0.01502
1990  0.5166      0.2208      0.1448      0.08807     0.06007     0.01496

Sorted results
Prob. Peak  96 hr 21 Day      60 Day      90 Day      Yearly
0.032258064516129 0.5444      0.2289      0.1477      0.08993     0.0616
      0.01572
0.0645161290322581      0.5184      0.2244      0.1471      0.08958
      0.06154     0.01545
0.0967741935483871      0.5184      0.2239      0.1464      0.08936
      0.06143     0.01545
0.129032258064516 0.5181      0.2238      0.1462      0.0893      0.06087
      0.01532
0.161290322580645 0.5178      0.2231      0.1461      0.08905     0.06085
      0.01523
0.193548387096774 0.5175      0.2227      0.146 0.08897     0.0608
      0.01522
```

0.225806451612903 0.5175 0.2224 0.1458 0.08886 0.06077
0.0152
0.258064516129032 0.5173 0.2223 0.1457 0.08876 0.06069
0.01516
0.290322580645161 0.5173 0.2216 0.1453 0.08861 0.06053
0.01516
0.32258064516129 0.5171 0.2215 0.1448 0.08808 0.0602
0.01513
0.354838709677419 0.5166 0.2212 0.1448 0.08807 0.06007
0.01509
0.387096774193548 0.5166 0.2212 0.1447 0.08772 0.05989
0.01505
0.419354838709677 0.5165 0.2208 0.1443 0.08741 0.05976
0.01502
0.451612903225806 0.5164 0.2205 0.1441 0.08728 0.05968
0.01496
0.483870967741936 0.516 0.2203 0.1439 0.08722 0.05955
0.01495
0.516129032258065 0.516 0.2202 0.1439 0.08722 0.05937
0.01495
0.548387096774194 0.5158 0.2197 0.1435 0.08719 0.05931
0.01493
0.580645161290323 0.5156 0.2197 0.1434 0.08686 0.05929
0.01492
0.612903225806452 0.5156 0.2193 0.1431 0.08675 0.05911
0.01489
0.645161290322581 0.5155 0.219 0.1429 0.08672 0.05883
0.01479
0.67741935483871 0.515 0.2187 0.1429 0.08647 0.05872
0.01474
0.709677419354839 0.515 0.218 0.1424 0.08629 0.0587 0.01471
0.741935483870968 0.5145 0.2176 0.1419 0.08583 0.0584
0.01463
0.774193548387097 0.5145 0.2175 0.1418 0.0858 0.05833
0.01462
0.806451612903226 0.5145 0.2175 0.1415 0.08574 0.05832
0.01457
0.838709677419355 0.5144 0.2171 0.1413 0.08549 0.05818
0.01449
0.870967741935484 0.5143 0.217 0.1413 0.08545 0.05797
0.01447
0.903225806451613 0.514 0.2166 0.141 0.08507 0.05767 0.01438
0.935483870967742 0.5136 0.2158 0.1405 0.08481 0.05763
0.01432
0.967741935483871 0.513 0.2146 0.1395 0.08411 0.05709
0.01423

0.1 **0.51837** 0.22389 0.14638 0.089354 0.061374 0.015437
Average of yearly averages: **0.014925**

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

Data used for this run:
Output File: Cypermethrin
Metfile: w23155.dvf
PRZM scenario: CAonion0C.txt
EXAMS environment file: ir298.exv
Chemical Name: Cypermethrin
Description Variable Name Value Units Comments

```
Molecular weight  mwt   416.3 g/mol
Henry's Law Const.      henry 3.4e-7      atm-m^3/mol
Vapor Pressure    vapr  2.5e-9      torr
Solubility  sol   0.040 mg/L
Kd    Kd          mg/L
Koc   Koc   141700      mg/L
Photolysis half-life    kdp   36.2  days  Half-life
Aerobic Aquatic Metabolism    kbacw 11.3  days  Halfife
Anaerobic Aquatic Metabolism  kbacs 19.3  days  Halfife
Aerobic Soil Metabolism asm   62    days  Halfife
Hydrolysis: pH 5  0     days  Half-life
Hydrolysis: pH 7  0     days  Half-life
Hydrolysis: pH 9  1.9   days  Half-life
Method:     CAM   2     integer     See PRZM manual
Incorporation Depth:    DEPI  0.0   cm
Application Rate: TAPP  0.112 kg/ha
Application Efficiency: APPEFF      0.95  fraction
Spray Drift DRFT  0.16  fraction of application rate applied to pond
Application Date  Date  10-05 dd/mm or dd/mmm or dd-mm or dd-mmm
Interval 1  interval    7     days  Set to 0 or delete line for single app.
Interval 2  interval    7     days  Set to 0 or delete line for single app.
Interval 3  interval    7     days  Set to 0 or delete line for single app.
Interval 4  interval    7     days  Set to 0 or delete line for single app.
Record 17:  FILTRA
      IPSCND      1
      UPTKF 0
Record 18:  PLVKRT      0
      PLDKRT      0.13
      FEXTRC      0.5
Flag for Index Res. Run IR    IR
Flag for runoff calc.   RUNOFF      total none, monthly or total(average of
entire run)
```

California Lettuce

```
stored as lettuce_California.out
Chemical: Cypermethrin
PRZM environment: CAlettuceC1.txt   modified Thuday, 17 February 2005 at
15:15:33
EXAMS environment: ir298.exv  modified Thuday, 29 August 2002 at 10:34:12
Metfile: w23273.dvf     modified Wedday, 3 July 2002 at 08:04:22
Water segment concentrations (ppb)
```

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	0.527	0.237	0.1567	0.1122	0.0809	0.02578
1962	0.5292	0.24	0.1592	0.1148	0.08369	0.0327
1963	0.5276	0.2367	0.1575	0.113	0.08325	0.02755
1964	0.5292	0.2398	0.1593	0.1146	0.08867	0.03054
1965	0.5456	0.2472	0.1588	0.1143	0.08266	0.03201
1966	0.5291	0.2394	0.1593	0.1146	0.08291	0.03206
1967	0.5293	0.2394	0.1594	0.1147	0.08298	0.0318
1968	0.5279	0.2379	0.1578	0.1133	0.09006	0.02681
1969	0.53	0.2406	0.1601	0.1155	0.08383	0.03498
1970	0.5298	0.2402	0.16	0.1152	0.08366	0.03189
1971	0.529	0.2393	0.159	0.1144	0.08307	0.02759
1972	0.5286	0.2391	0.1586	0.114	0.08388	0.03002
1973	0.5301	0.2406	0.1603	0.1156	0.08391	0.0385
1974	0.7126	0.3176	0.16	0.1154	0.08593	0.04074

1975	0.5298	0.2405	0.1599	0.1153	0.08394	0.03005
1976	0.7596	0.3508	0.1932	0.1564	0.1256	0.039
1977	0.5282	0.2382	0.1581	0.1137	0.08211	0.02933
1978	1.148	0.6764	0.2604	0.1586	0.1181	0.04938
1979	0.5287	0.2382	0.1588	0.1144	0.08294	0.02996
1980	0.5284	0.2385	0.1583	0.1139	0.08233	0.03276
1981	0.528	0.2379	0.1578	0.1135	0.08285	0.03021
1982	0.5276	0.2368	0.1574	0.113	0.08169	0.02908
1983	0.5244	0.2317	0.1534	0.1098	0.08225	0.03662
1984	0.524	0.2308	0.153	0.1092	0.07765	0.0257
1985	0.5272	0.2368	0.157	0.1126	0.08133	0.02821
1986	0.5285	0.239	0.1584	0.1175	0.08587	0.02933
1987	0.5282	0.2384	0.1581	0.1137	0.0839	0.03015
1988	0.5276	0.238	0.1573	0.1131	0.08173	0.02862
1989	0.5284	0.2387	0.1583	0.114	0.08255	0.02523
1990	0.5265	0.2362	0.1561	0.1122	0.08074	0.02415

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.1	**0.6959**		0.31056	0.16028	0.11731	0.089921	0.03895

Average of yearly averages: **0.0313583333333333**

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

Data used for this run:
Output File: lettuce_California
Metfile: w23273.dvf
PRZM scenario: CAlettuceC1.txt
EXAMS environment file: ir298.exv
Chemical Name: Cypermethrin

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	416.3	g/mol	
Henry's Law Const.	henry	3.4e-7	atm-m^3/mol	
Vapor Pressure	vapr	2.5e-9	torr	
Solubility	sol	0.04	mg/L	
Kd	Kd		mg/L	
Koc	Koc	141700	mg/L	
Photolysis half-life	kdp	36.2	days	Half-life
Aerobic Aquatic Metabolism	kbacw	11.3	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	19.3	days	Halfife
Aerobic Soil Metabolism	asm	62	days	Halfife
Hydrolysis: pH 5	0		days	Half-life
Hydrolysis: pH 7	0		days	Half-life
Hydrolysis: pH 9	1.9		days	Half-life
Method:	CAM	2	integer	See PRZM manual
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	0.112	kg/ha	
Application Efficiency:	APPEFF	0.95	fraction	
Spray Drift	DRFT	0.16	fraction of application rate applied to pond	
Application Date	Date	1-8	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	7	days	Set to 0 or delete line for single app.
Interval 2	interval	7	days	Set to 0 or delete line for single app.
Interval 3	interval	7	days	Set to 0 or delete line for single app.
Interval 4	interval	7	days	Set to 0 or delete line for single app.
Interval 5	interval	7	days	Set to 0 or delete line for single app.

Record 17: FILTRA
IPSCND 1
UPTKF

```
Record 18:  PLVKRT
      PLDKRT      0.13
      FEXTRC      0.5
Flag for Index Res. Run IR    IR
Flag for runoff calc.   RUNOFF      total none, monthly or total(average of
entire run)
Write Benthic Porewater File? benthic     0
Write Benthic Sediment File?  benthicsed  0
```