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

OFFICE OF
CHEMICAL SAFETY AND
POLLUTION PREVENTION

June 30, 2011

MEMORANDUM

SUBJECT: Revised Chlorpyrifos Preliminary Registration Review Drinking Water Assessment **PC Code: 059101; DP Barcode: 368388, 389480**

TO: Yan Donovan, Chemical Review Manager
Tom Myers, Team Leader
Mary Manibusan, Branch Chief
Risk Management and Implementation Branch 2
Pesticide Re-Evaluation Division (7508P)

FROM: Rochelle F. H. Bohaty Ph.D., Chemist Rochelle F H Bohaty 6/30/11
Environmental Risk Branch 3
Environmental Fate and Effects Division (7507P)

REVIEWED BY: James Hetrick, Ph.D., Senior Scientist James C. Hetrick 6/30/11
Environmental Risk Branch 3
Environmental Fate and Effects Division (7507P)

APPROVED BY: Dana Spatz, Branch Chief 6/30/11
Environmental Risk Branch 3
Environmental Fate and Effects Division (7507P)

EXECUTIVE SUMMARY

This memorandum provides a preliminary drinking water assessment (DWA) for the reregistration of chlorpyrifos (*O,O*-diethyl o-(3,5,6-trichloro-2-pyridyl phosphorothioate; CAS 2921-88-2). Chlorpyrifos is a broad spectrum organophosphate insecticide that inhibits acetylcholinesterase activity. Chlorpyrifos is registered for use on a variety of terrestrial food and feed crops, terrestrial non-food crops, and greenhouse food/non-food crops. Based on usage data provided by the Biological and Economic Analysis Division (BEAD), more than 8 million pounds of chlorpyrifos are used each year for agriculture purposes in the United States.[1]

1 Chlorpyrifos (059101) Screening Level Usage Analysis, March 10, 2010.

This preliminary DWA provides estimated drinking water concentrations (EDWCs) based on Tier I groundwater and Tier II surface water model simulations for currently registered uses of chlorpyrifos provided on the most recent label data report provided by BEAD[2] as well as recent revisions to chlorpyrifos labels (updated since 2/6/2009—as noted). This preliminary DWA also considers monitoring data from several different programs.

EDWCs are provided for chlorpyrifos and chlorpyrifos-oxon, a known transformation product of chlorpyrifos. EDWCs for chlorpyrifos-oxon were derived from EDWCs calculated for chlorpyrifos because there are limited environmental fate data available for chlorpyrifos-oxon and chlorpyrifos is expected to transform to chlorpyrifos-oxon during drinking water treatment. Chlorpyrifos EDWCs were multiplied by 0.9541 (molecular weight correction factor) and 100% (maximum conversion during water purification) to generate chlorpyrifos-oxon EDWCs. A 100% conversion factor for the oxidation of chlorpyrifos to chlorpyrifos-oxon was used as a conservative approximation based on bench scale laboratory data that indicate chlorpyrifos rapidly oxidizes to form chlorpyrifos-oxon almost quantitatively during water treatment.[3] Currently, there are no data available on the removal efficiency of chlorpyrifos prior to chlorination or the removal efficiency of chlorpyrifos-oxon after formation. Stability studies indicate that once chlorpyrifos-oxon forms little transformation is likely to occur between water treatment and consumption (drinking water distribution). It is possible that some drinking water treatment procedures such as use of granular activated carbon filtration and water softening (increased rate of chlorpyrifos-oxon hydrolysis at pH > 9) may reduce the amount of chlorpyrifos-oxon in drinking water.[4] It is unlikely, however, that these treatment processes completely remove chlorpyrifos-oxon from drinking water. In addition, these treatment methods are not typical practices across the country for surface water. For these reasons, 100% of the chlorpyrifos making it into the treatment plant is assumed to be converted to the oxon, which ultimately ends up in drinking water. Thus chlorpyrifos-oxon is the residue of concern for drinking water. Another degradation product of chlorpyrifos, 3,5,6-trichloro-2-pyridinol (TCP) included in previous DWAs is not examined in this assessment as requested by the Health Effects Division (HED) as it is no longer considered in the human health assessment as a degradate of toxicological concern.[5]

It is important to note that there are several uncertainties associated with this drinking water assessment. As a result assumptions were made in order to complete this preliminary DWA. All input parameter assumptions used in this assessment are discussed in detail in the **Analysis** section of this document; however, a summary of these uncertainties, assumptions and the likely impact on this DWA are highlighted below.

2 Chlorpyrifos (059101) Label Data Report, February 6, 2009.
3 Duirk, S. E.; Collette, T. W.; Degradation of Chlorpyrifos in Aqueous Chlorine Solutions: Pathways, Kinetics, and Modeling. *Environ. Sci. Technol.*, 2006, *40(2)*, 546-550.
4 *Progress Report on Estimating Pesticide Concentrations in Drinking Water and Assessing Water Treatment Effects on Pesticide Removal and Transformation: A Consultation.* FIFRA Scientific Advisory Panel Meeting, Sept 29, 2000; SAP Report No. 2001-02 February 12, 2011.
5 Email from Danette Drew (EPA/HED) to Rochelle Bohaty (EPA/EFED), September. 21, 2010.

- While the predominate water treatment method used to disinfect drinking water throughout the United States is chlorination, there are other treatment methods that may reduce chlorpyrifos or chlorpyrifos-oxon exposure concentrations. For facilities that utilize alternative methods, the laboratory data showing 100% conversion of chlorpyrifos to chlorpyrifos-oxon during water purification may not be applicable. Therefore, the chlorpyrifos oxon exposure values presented here may be overestimated for those facilities. Additionally, the oxon may be partially removed with certain treatment processes. In order to reduce the uncertainty associated with the EDWCs reported in this DWA, additional data including both targeted monitoring data as well as data on the removal efficiency of chlorpyrifos and chlorpyrifos-oxon during treatment is needed. This assessment does not take into account the potential loss of mass (either chlorpyrifos or chlorpyrifos-oxon) during treatment from methods such as activated carbon, sedimentation, water softening, etc., as these treatment methods as well as the sequence of these treatment methods vary considerably across the country. Therefore, for systems that do utilize such treatment methods, the EDWCs reported in this assessment may be higher than the likely exposure concentrations in drinking water. The amount of overestimation is unknown, as currently there are no data available on the removal efficiency of either chlorpyrifos or chlorpyrifos-oxon by these various treatment methods and sequences of treatments. The exception is for water softening where laboratory data can be used to calculate the rate of hydrolysis under water softening conditions ($pH \geq 11$) for both chlorpyrifos and chlorpyrifos-oxon. Water softening, however, is not a common treatment process for surface water.

- Chlorpyrifos is registered for use on turf (including sod farms, golf courses, road medians, and industrial areas), therefore, a percent cropped area (PCA) of 1 (100% of the watershed is treated) was applied to the modeling results in order to cover the use on non-agricultural land. If chlorpyrifos was not registered on turf, the default PCA value of 0.87 (87% of the watershed is treated) would have been used. EFED is currently working on developing crop specific PCAs. For the final DWA, a turf specific PCA may be available to help further refine this assessment. This assessment is national in scope covering multiple chlorpyrifos uses; therefore, it does not take into account regional PCA values (e.g., 0.87 for Missouri, 0.82 for Ohio, 0.07 for Upper Colorado, etc.) or PCA values that represent only a single or a few crops (e.g., 0.46 for corn, 0.83 for corn and soybean, etc.).

- The monitoring programs analyzed for this drinking water assessment do not specifically target chlorpyrifos. Consequently, detections cannot be directly associated with a particular use pattern or site, nor are the detections expected to represent the potential peak chlorpyrifos or chlorpyrifos-oxon exposures. In order to reduce uncertainties and help refine the current exposure assessment, EFED is seeking to incorporate targeted monitoring data in its drinking water assessment.

In addition to the uncertainties listed above, there are uncertainties and/or assumptions associated with labeling and use rates. Each are listed below, along with the potential impact on the DWA.

- Meteorological data and crop profiles, as well as best professional judgment, were used to establish an application date for modeling; however, the selected date may not represent the intended or actual application dates. The application date used for model runs can significantly alter the EDWCs; thus, EDWCs reported could over or under predict the potential exposure. For some chlorpyrifos use scenarios several application dates were evaluated. In general, the date that provided the most conservative EDWCs and corresponded to the appropriate pest pressure are reported. A brief examination of the variation in peak EDWCs for some of the multi-run scenarios ranged from 3-23% for peak EDWCs. Scenarios examined included those that resulted in high and low EDWCs. Based on this limited examination, the application date chosen for modeling can change the peak EDWCs by as much as 23%. This is only an estimate and may vary depending on the scenario (soil and metrological data) and may not represent all chlorpyrifos use scenarios.

- Many chlorpyrifos labels include application restrictions on a per season basis; however, for some crops there can be multiple seasons per year. For modeling purposes one season was considered to be equal to one year unless otherwise noted. If multiple crop seasons are possible per year it is conceivable that the EDWCs reported in this document may underestimate the actual exposure. In general, this assessment makes conservative assumptions regarding re-cropping and rotations. EFED evaluated a number of labels for specific information regarding application methods and timing, and noted some application rates provided on the label are on a per season basis. The yearly application rates used in this assessment are primarily based on data from BEAD's label data report. The typical use data provided by BEAD to date do not inform this uncertainty as the typical use rate information was not provided for crops that may have multiple seasons per year.

- Some of the labels do not provide maximum single or annual application rates for chlorpyrifos or application retreatment intervals. When this information is not specified on the label, a conservative application scenario was developed and modeled. For example, several labels permit trunk sprays (e.g., some orchard fruit and nut trees such as apples and almonds), at a dilution rate in lbs a.i./100 gallons of water; however, the amount of the dilution that can be applied is not stated on the label. The application rate was assumed to be lb a.i./a. It is unclear if this approach is representative of the intended or actual use scenarios. However, we did find that the average typical application rate provided by BEAD for apples was consistent with the assumed application rate for apples (trunk drench) made for modeling purposes. The extent to which actual use rates may be different is uncertain.

- Some labels restrict the amount of a specific chlorpyrifos formulation; however, the total amount of chlorpyrifos that can be applied per year is not provided. Therefore, the use of

multiple chlorpyrifos-containing products is possible. This assessment does not consider the combined use of multiple chlorpyrifos containing products that contain such language, but if such use occurs the reported EDWCs in this assessment may not account for this event.

- Application rates (maximum single applications and yearly/seasonal) vary between labels. Recently approved labels better define chlorpyrifos use; however, there are still several older active labels that do not provide application restrictions or have higher maximum single and/or yearly applications rates than recently approved labels. The most conservative scenarios (highest applications rates) were modeled unless otherwise noted. In order to reduce the uncertainty associated with the EDWCs reported in this preliminary DWA, all chlorpyrifos labels should be updated to clearly state maximum yearly and single application rates, as well as minimum retreatment intervals.

Based on modeling results, EDWCs for chlorpyrifos and chlorpyrifos-oxon generated from surface water sources provide higher estimates of the potential exposure to either of these chemicals in drinking water than those from groundwater. Depending on the use scenario, tier I groundwater EDWCs range from 0.1-1.1 µg/L and 0.1-1.0 µg/L for chlorpyrifos and chlorpyrifos-oxon, respectively.[6]

Tier II chlorpyrifos-oxon EDWCs for grapes, corn/soybean and sugar beets are provided in **Table 1**. Grape, corn/soybean, and sugar beet were singled out for this preliminary drinking water assessment as representative crops because there is a large amount (>100,000 lb) of chlorpyrifos applied to these crops per year, a substantial portion (percent crop treated/percent crop planted) of these crops are treated with chlorpyrifos, or the use locations are distributed throughout the United States. In addition, the reported EDWCs for grapes, corn/soybean and sugar beets are generally representative of the other chlorpyrifos use scenarios modeled when EDWCs are compared. Because chlorpyrifos is registered for use on turf (including sod farms, golf courses, road medians and industrial areas) a percent cropped area (PCA) of 1 (considers 100% of watershed is treated with chlorpyrifos) was applied to all modeling results. The PCA adjusted EDWCs are reported.

6 SCI-GROW provides a single output value that represents the concentrations that might be expected in shallow unconfined aquifers under sandy soils. Output is recommended for both acute and chronic endpoints.

Table 1. Estimated Drinking Water Concentrations of Chlorpyrifos and Chlorpyrifos-oxon Resulting From Chlorpyrifos Use on Grapes, Corn/Soybean, and Sugar beets

Crop Scenario	Chlorpyrifos (ppb)			Chlorpyrifos-oxon (ppb)		
	1-in-10 Year Peak	1-in-10 Year Annual Average	30 Year Average	1-in-10 Year Peak	1-in-10 Year Annual Average	30 Year Average
Grapes LR	112.20	14.74	9.83	107.05	14.06	9.38
Corn/Soybean	30.90	4.61	3.12	29.49	4.39	2.98
Sugar beets	10.55	1.12	0.69	10.06	1.07	0.65

There are two modeled chlorpyrifos use scenarios that result in EDWCs that are substantially higher than the majority of the modeled chlorpyrifos use scenarios. These use scenarios are for grape and turf. The EDWCs reported for Grape HR (high rate; 33 lbs a.i./acre) are the result of a high application rate trunk drench/soil application which is currently permitted on labels and may not represent actual or intended use of chlorpyrifos on grape. Some labels restrict the use of chlorpyrifos on grape to 6 lbs a.i./a. The EDWCs reported for Turf FA (frequent applications) is based on 26 applications (limit of PRZM-EXAMS) and a 3 day application interval. This scenario was developed to highlight the uncertainty associated with the unrestricted (turf labels do not currently restrict the number of chlorpyrifos applications per year) use of chlorpyrifos on turf and may not represent actual or intended use. If more than 26 applications per year are made, or if the application interval is less than 3 days, the EDWCs reported in this DWA may underestimate the exposures resulting from chlorpyrifos use on turf. Further analysis of these two uses is provided in the **Analysis** section of this preliminary DWA.

BEAD provided typical use information to help refine this preliminary assessment.[7] In general, preliminary analysis suggests that typical average single application rates correlate well with the modeled single application rates; however, in general the number of applications typically applied each year is less than the maximum allowed on current labels. Typical agronomic practices also vary from those modeled. In general, the farming methods used over the last five years result in EDWCs that are lower than the scenarios modeled. Further analysis of typical chlorpyrifos use rates and agronomic practices will be incorporated into the final assessment, including the analysis of the typical upper bound single application rates as compared to the average typical single application rates used in this assessment.

Water monitoring data from the USGS National Water-Quality Assessment Program (NAWQA), USEPA/USGS Pilot Reservoir Monitoring Program, USDA Pesticide Data Program (PDP), California Department of Pesticide Regulation (CDPR), and National Center for Water Quality Research (NCWQR) at Heidelberg College were evaluated in reference to an acute exposure concern to chlorpyrifos and its degradation product chlorpyrifos oxon. The monitoring data show

7 Memorandum from Katherine Stebbins (EPA/BEAD) to Rochelle Bohaty (EPA/EFED), Jun. 24, 2011; Typical Use Data for Chlorpyrifos (Appendix D).

chlorpyrifos detections at low concentrations, generally not exceeding 0.5 µg/L. For example, USGS NAWQA, which contains an extensive monitoring dataset for chlorpyrifos and chlorpyrifos oxon, reports a peak chlorpyrifos detection of 0.57 µg/L in surface water with a detection frequency of approximately 15% (**Table 2**). CDPR and NCWQR have detected chlorpyrifos concentrations greater than 1 ppb in surface water on several occasions. Peak concentrations of chlorpyrifos observed for CDPR and NCWQR are 3.96 and 24 µg/L, respectively. The detection frequencies of chlorpyrifos in these two programs are 25% for CDPR and 8% for NCWQR, as detailed in **Table 2**. Note, the data from NCWQR have not yet been thoroughly reviewed by EPA, but are presented here as supplemental information. In addition, the NCWQR data currently available to EFED are pre-2000, when the Agency required significant mitigation in its Reregistration Eligibility Decision. Therefore, it is unclear if NCWQR monitoring data represent current chlorpyrifos use. EFED is in the process of acquiring more recent data from NCWQR and conducting a more thorough review of the NCWQR data. Further discussion of the monitoring data and its associated deficiencies are included in the **Analysis** sections of this document and the data are provided in **Appendix C**.

Table 2. Summary of Water Monitoring Data for Chlorpyrifos and Chlorpyrifos-oxon

Parameter	Surface Water		Groundwater	
	Chlorpyrifos	Chlorpyrifos-oxon	Chlorpyrifos	Chlorpyrifos-oxon
USGS NAWQA				
Sampling Years	1991-2010	1999-2010	1992-2010	2005-2010
Qualified Detections	4132	19	44	3
Frequency of Detections	14.75%	0.33%	0.42%	<1%
Maximum Detection	0.57 µg/L 2003 Las Vegas, NV (urban)	0.0543 µg/L 2008 Washington, MS (cropland)	0.0707 µg/L 2002 Miller, MS (cropland)	0.0553 µg/L 2009 Colbert, TN (agriculture)
NCWQR at Heidelberg College				
Source	Sandusky River	Maumee River		
Sampling Years	1983-1999	1983-1999		
Number of Samples	1595	1435		
Qualified Detections	147	100		
Frequency of Detections	9.2%	7%		
Maximum Detection	10.9 µg/L 1992	24.0 µg/L 1992		
CDPR				
Sampling Years	1991-2005			
Qualified	1857			

Parameter	Surface Water		Groundwater	
	Chlorpyrifos	Chlorpyrifos-oxon	Chlorpyrifos	Chlorpyrifos-oxon
Detections				
Frequency of Detections	25.1%			
Maximum Detection	3.96 µg/L 2003 Monterey County, CA Quail Creek (ID # 7929)			

The reported concentrations from monitoring data are lower than estimated concentrations derived from modeling. This result is attributed to the fact that water monitoring sampling programs do not specifically target chlorpyrifos use areas, may not represent high chlorpyrifos use areas and may not corresponding with applications of chlorpyrifos; therefore, peak concentrations of chlorpyrifos and chlorpyrifos-oxon may not be detected. For most monitoring locations, sampling frequencies are not designed to capture peak concentrations. Model generated times series data suggest that monitoring programs need to sample daily in order to capture peak concentrations of chlorpyrifos in surface water. There are also limited sampling data available for some areas in the United States and very limited data following drinking water treatment. EFED is unaware of any monitoring data for chlorpyrifos or chlorpyrifos-oxon at the point of consumption (i.e., consumer tap water). Because currently available monitoring data likely underestimate chlorpyrifos and chlorpyrifos-oxon concentrations, monitoring results are not an appropriate prediction of the potential exposure resulting from chlorpyrifos use. For these reasons, EFED does **not** recommend that chlorpyrifos or chlorpyrifos-oxon water monitoring data be used by HED in the human health risk assessment.

In summary, modeling data indicate that a wide range of chlorpyrifos uses can lead to high levels of chlorpyrifos in surface water that could be used by community water systems to supply drinking water. In hopes of refining the EDWCs presented in this assessment, several sources of water monitoring data were evaluated. At this time, these data are not considered appropriate for quantitative use in risk assessment because the monitoring programs were not designed to specifically target chlorpyrifos use, sample frequencies were inadequate to detect peak concentrations, the sample sites were limited or, as in the case of the NCWQR, the data have not been rigorously reviewed. Once chlorpyrifos reaches a drinking water treatment facility, several sources of empirical data suggest that chlorpyrifos readily converts to chlorpyrifos-oxon upon chlorination. The removal efficiency (filtration, sedimentation, etc.) of chlorpyrifos prior to chlorination or chlorpyrifos-oxon following chlorination is unknown. Since 1) chlorination is the primary disinfection process used in the United States, 2) data indicate conversion of chlorpyrifos to chlorpyrifos-oxon, and 3) the physical removal efficiency of either compound is unknown, it is assumed that high levels of chlorpyrifos-oxon could end up in drinking water. Additional information, as described above, would help to refine the exposure estimates.

PROBLEM FORMULATION

Chlorpyrifos (*O,O*-diethyl o-(3,5,6-trichloro-2-pyridyl phosphorothioate; CAS 2921-88-2) is a broad spectrum organophosphate insecticide that inhibits acetyl cholinesterase activity. The chemical structure of chlorpyrifos is provided in **Figure 1**. Chemical identification and physical chemical properties of chlorpyrifos are provided in **Table 3**.

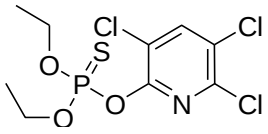


Figure 1. Chemical Structure of Chlorpyrifos

Table 3. Chemical Identification Information for Chlorpyrifos

Chemical Name	*O,O*-diethyl o-(3,5,6-trichloro-2-pyridyl phosphorothioate
Chemical Abstracts Service (CAS) Registry Number	2921-88-2
Empirical Formula	$C_{20}H_{17}F_5N_2O_2$
USEPA Pesticide Code (PC #)	059101
Smiles Notation	S=P(OC1=NC(=C(C=C1Cl)Cl)Cl)(OCC)OCC
Molecular Mass	350.57 g/mol
Vapor Pressure (25 °C)	$1.87x10^{-5}$ torr
Water Solubility (20 °C)	1.4 mg/L
Henry's Law Constant	6.2×10^{-6} atm - m^3/mol
Log K_{ow}	4.7

Use Characterization

Chlorpyrifos is registered for use on a variety of terrestrial food and feed crops, terrestrial non-food crops, and greenhouse food/non-food crops. Chlorpyrifos is applied in liquid, granular, or encapsulated form using aerial and ground application methods including broadcast, soil incorporation and chemigation. Registered labels require 25 feet (ground boom and chemigation), 50 feet (orchard airblast), or 150 feet (aerial) buffer zones. Based on usage data provided by the Biological and Economic Analysis Division (BEAD), more than 8 million pounds of chlorpyrifos are used each year for agricultural purposes in the United States.[1] Approximately 37% and 14% of the total volume of chlorpyrifos used in the United States each year is applied to corn and soybean, respectively. Other crops treated with large amounts of chlorpyrifos include alfalfa, almonds, apples, citrus, grapes, peanuts, pecans, sugar beets, sweet potatoes, tobacco, walnuts and wheat. At least 100,000 pounds of chlorpyrifos are applied to each of these crops per year. A large fraction, at least 40%, of the total acreage planted with apples, broccoli, citrus, peaches, pecans, sweet corn and walnuts are treated with chlorpyrifos. Chlorpyrifos can also be used to treat wood such as fence posts, utility poles and railroad ties. Chlorpyrifos is also used on turf. No usage data are available for either of these two use patterns.

The geographic extent of chlorpyrifos use is widespread. The spatial distribution of the 2006-2008 agricultural usage data is presented in **Figure 2**.[8] This map reveals intensive agricultural use of chlorpyrifos in parts of California, Georgia, Indiana, Iowa, North Dakota and Pennsylvania. Other states with high chlorpyrifos use include Florida, Illinois, Michigan, New York, Minnesota, Ohio, Washington, and Wisconsin. Use of chlorpyrifos is restricted in Mississippi and California, as well as other states or geographical regions depending on the use.

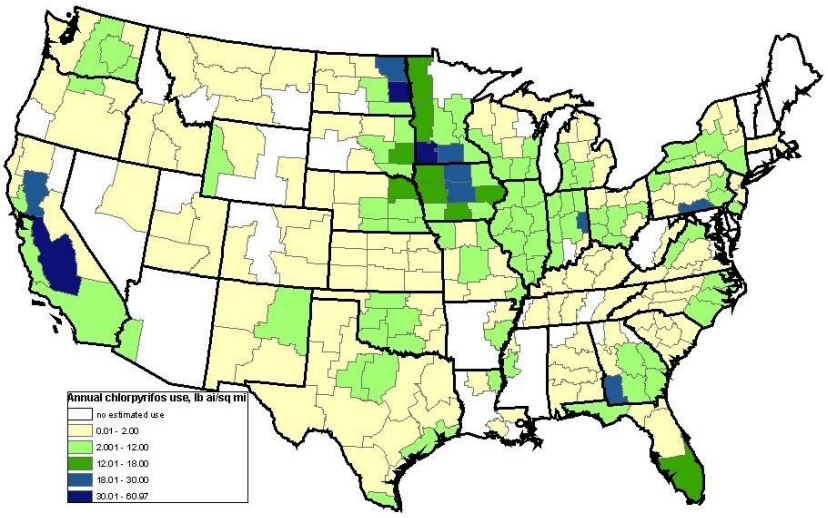


Figure 2. 2006-2008 Chlorpyrifos Use Spatial Distribution; BEAD agricultural chemical use data for chlorpyrifos[9]

Application rates vary significantly depending on the crop use. The highest number of applications listed on an agriculture label containing chlorpyrifos is eight at a rate of 1.5 lb a.i./a per acre for cherries (Reg. No. 062719-00221 and 062719-00301).[2] The highest single application rate of chlorpyrifos is one application at up to 33.3 lb a.i./a (7.5×10^{-4} lbs a.i./ft^2) for soil treatment on grapes (Reg. No. 062719-00591, 019713-00520, 019713-00599, 062719-00301 and 062719-00220). The second highest single application rate is 6 lb a.i./a on citrus (Reg. No. 062719-00301, 062719-00220, 062719-00221 and 019713-00599). Multiple types of applications are permitted on citrus including soil and foliar applications. For example, labels permit two foliar applications (7.5 lb) and three soil applications (orchard floors; 3 lbs) per acre per year. The minimum application interval specified between chlorpyrifos applications range from 7 to 30 days; however, some labels do not provide a minimum retreatment interval. Some labels permit chlorpyrifos applications to turf on an "as needed" basis. Currently approved chlorpyrifos application rates and methods are shown in **Table 4**.

8 Memorandum from Arthur Grube (EPA/BEAD) to Nelson Thurman (EPA/EFED), Feb. 23, 2011; GfK Kynetec. Argotrack Pesticide Database 2006-2008.
9 GIS map generated by Nelson Thurman (EPA/EFED)

Table 4. Examples of Currently Registered Chlorpyrifos Uses

Crop/Site	Application Type/ Method	Single Application Rate Range (lb a.i./A)	Maximum Application Rate Per Year[b] (lb a.i./A)	Maximum Application Number	Minimum Retreatment Interval (days)	Comments
Alfalfa	Aerial or ground/ broadcast, in-furrow, granule and chemigation	0.25-1.0	4.0	4	10	Several labels do not restrict the use of multiple products that contain chlorpyrifos only the amount of the specified formulation.
Almond	Aerial or ground/ broadcast, drench, granule and chemigation	0.25-1.0 Dormant/Delayed Dormant 2.0 Foliar 3/100 gal water Trunk Spray or Pre-plant Dip 2.0-4.0 Orchard Floors	1.0* Dormant/Delayed Dormant 4.0* Foliar 3/100 gal water Trunk Spray or Pre-plant Dip 4.0* Orchard Floors **Total:** cannot be determined	1 Dormant/Delayed Dormant 3 Foliar 1 Trunk Spray or Pre-plant Dip 2 Orchard Floors **Total: 7**	10	Dormant/Delayed Dormant: Restricted use in California. Orchard Floors: Restricted use in California. Several labels only specify dilution factors and do not provide application rates for uses including trunk drenches.
Asparagus	Aerial or ground/ broadcast, granule and chemigation	0.9-3.0 (3.0 is granular formulation)	3.0	2	10	Several labels do not specify seasonal or yearly maximum application rates.
Apple	Aerial or ground/ broadcast or drench	0.25-2.0 Dormant/Delayed Dormant 1.5 lb ai/100 gal Trunk Spray or Pre-plant Dip	4.0 Dormant/Delayed Dormant 1.5 lb ai/100 gal Trunk Spray or Pre-plant Dip **Total:** cannot be determined	2 Dormant/Delayed Dormant 1 Trunk Spray or Pre-plant Dip **Total: 2**	10	Tree Trunk: Use permitted in states east of the Rockies (except Mississippi). Applications rates are given as a dilution factor.
Cherries	Ground/broadcast	1.0-4.0	12.0	8	10	Some labels do not provide

Crop/Site	Application Type/ Method	Single Application Rate Range (lb a.i./A)	Maximum Application Rate Per Year[b] (lb a.i./A)	Maximum Application Number	Minimum Retreatment Interval (days)	Comments
	and drench	Foliar 1.5-3.0/100 gal Trunk Spray	Foliar 9.0 Trunk Spray **Total: 21.0**	Foliar 3 Trunk Spray **Total: 11**	Foliar ns Trunk Spray	application rates for uses including trunk drenches; labels only specify dilution factors. Trunk Spray: There is no application retreatment interval specified on the labels.
Citrus	Aerial or ground/ broadcast, granule and chemigation	1.0-6.0 Foliar 0.75-1.0 Orchard Floor	7.5 Foliar 3.0 Orchard Floor **Total:** 10.5	2 Foliar 3 Orchard Floor **Total:** cannot be determined	30 (10 days for low application rates) Foliar 10 Orchard Floor	Registered labels permit both foliar and soil applications in the same orchard. Orchard Floor: Some labels do not have application restrictions rate restrictions. Also some labels do not specifically limit the retreatment interval. Labels also do not restrict multiple application types such as foliar and orchard floors.
Cole Crop (Brassica) Leafy Vegetables and Radish; Rutabaga and Turnip	Aerial or ground/ broadcast	0.92–2.582	6.0*	3*	10	The labels permit both soil and foliar applications in one growing season.
Corn	Aerial or ground/ broadcast, granule, seed and chemigation	0.74-1.6	3.0	3	10	

Crop/Site	Application Type/ Method	Single Application Rate Range (lb a.i./A)	Maximum Application Rate Per Year[b] (lb a.i./A)	Maximum Application Number	Minimum Retreatment Interval (days)	Comments
Cotton	Aerial or ground/ broadcast and chemigation	0.5-1.0	3.0	3	10	
Cranberry	Aerial or ground/ broadcast and chemigation	1.408-1.5	3.0*	2*	10	
Figs	Ground/ broadcast	1.8775-2.0	2.0	1	ns	Use is restricted to only California. Incorporation to 3 inches is suggested but not required following application.
Filberts	Aerial or ground/ broadcast	1.0-4.0 Foliar	4.0 Foliar	3 Foliar	10	For some labels the retreatment interval is not specified.
Grapes	Ground/broadcast, basal spray and drench	1.0-33.3	33.3	3	ns	Several labels do not specify seasonal or yearly maximum application rates. Registered labels only provide a dilution factor and not an application rate in lbs ai/a for the soil application. The high application rate is permitted on the 11-15ft^2 (3.75-4.4 ft circle) at the base of the vine (trunk). Vineyard density is generally reported to be 500-1300 vines per acre; however, a method known as high density planting may result in a vine density near 3000 vines per acre. For

Crop/Site	Application Type/ Method	Single Application Rate Range (lb a.i./A)	Maximum Application Rate Per Year[b] (lb a.i./A)	Maximum Application Number	Minimum Retreatment Interval (days)	Comments
						example, if vines are spaced 4 feet by 4 feet approximately 2756 vines can be planted per acre. California specific label permits three applications at 1 lb a.i./a. Other locations restricted to one application.
Legume Vegetables	Ground/ broadcast, seed (incorporation suggested)	1.0	1.0	1*	na	
Mint	Ground/broadcast and chemigation	1.0-2.0	6.0*	3*	ns	Labels allow one pre-plant application, one application during the growing season and one post-harvest application per season.
Nectarine	Aerial or ground/ broadcast or drench	0.25-2.0 (Dormant/Delayed Dormant) 2.9 Foliar 3/100 gal water Trunk Spray or Pre-plant Dip	2.0* (Dormant/Delayed Dormant) 3/100 gal water 5.8 Foliar Trunk Spray or Pre-plant Dip **Total: 2**	1 Dormant/Delayed Dormant 2 Foliar 1 Trunk Spray or Pre-plant Dip **Total: 1**	10	Dormant/Delayed Dormant: Restricted use in California. Foliar: Some of the currently registered labels only provide a dilution factor and not an application rate in lb a.i./a Trunk Spray or Preplant Dip: There is no application retreatment interval specified on the label. The application rate is also provided as a dilution factor. Newer labels limit the amount of

Crop/Site	Application Type/ Method	Single Application Rate Range (lb a.i./A)	Maximum Application Rate Per Year[b] (lb a.i./A)	Maximum Application Number	Minimum Retreatment Interval (days)	Comments
						chlorpyrifos that can be applied per year; however, not all labels appear to be updated. Newer labels limit the amount of chlorpyrifos that can be applied per year; however, all labels do not appear to have been updated. Therefore, it is possible that multiple types of applications can occur such as soil, foliar and/or post-harvest and dormant/delayed dormant applications.
Onion Bulbs	Ground/drench or directed spray	1.0 Pre-plant 1.0 Post-plant	2.0	2	ns	
Peach	Aerial or ground/ broadcast or drench	0.25-2.0 (Dormant/Delayed Dormant) 2.9 Foliar 2.8-3/100 gal water Trunk Spray or Pre-plant Dip	2.0* Dormant/Delayed Dormant 5.8 Foliar 3/100 gal water Trunk Spray or Preplant Dip **Total : 2.0**	2* Dormant/Delayed Dormant 2 Foliar 1 Trunk Spray or Preplant Dip **Total: 1**	10	Dormant/Delayed Dormant: Restricted use in California. Foliar: Some of the currently registered labels only provide a dilution factor and not an application rate in lb a.i./a Trunk Spray or Preplant Dip: There is no application retreatment interval specified on some of the labels. Newer labels limit the amount of

Crop/Site	Application Type/ Method	Single Application Rate Range (lb a.i./A)	Maximum Application Rate Per Year[b] (lb a.i./A)	Maximum Application Number	Minimum Retreatment Interval (days)	Comments
						chlorpyrifos that can be applied per year; however, all labels do not appear to have been updated. Therefore, it is possible that multiple types of applications can occur such as soil, foliar and/or post-harvest and dormant/delayed dormant applications.
Peanut	Aerial or ground/ broadcast	1.0-2.0	4.0*	2	10	No more than one pre-plant application is permitted per season. Pre-plant applications are incorporated 3 to 4 inches.
Pear	Aerial or ground/ broadcast	0.25-2 Dormant/Delayed Dormant 2.0 Post-harvest	2.0* Dormant/Delayed Dormant 2.0 Post-harvest **Total: 4.0**	1 Dormant/Delayed Dormant 1 Post-harvest **Total: 2.0**	10	Dormant/Delayed Dormant: Restricted use in California. Some labels only permit use in California, Oregon and Washington. Newer labels limit the amount of chlorpyrifos that can be applied per year; however, all labels do not appear to have been updated. Therefore, it is possible that multiple types of applications can occur in one year such as a post-harvest application and a dormant/delayed dormant application.
Pecans	Aerial or ground/	1.0-2.0	6.0	3	10	Labels also do not restrict

Crop/Site	Application Type/ Method	Single Application Rate Range (lb a.i./A)	Maximum Application Rate Per Year[b] (lb a.i./A)	Maximum Application Number	Minimum Retreatment Interval (days)	Comments
	broadcast and chemigation	Foliar 2.0-4.0 Orchard Floor	Foliar 4.0 Orchard Floor **Total: 10**	Foliar 2 Orchard Floor **Total: 5**		multiple application types such as foliar and orchard floors.
Plum or Plums	Aerial or ground/ broadcast	0.25-2.0 Dormant/Delayed Dormant	2.0* Dormant/Delayed Dormant	1 Dormant/Delayed Dormant	ns	Dormant/Delayed Dormant: Restricted use in California.
Golf Course Turf and Industrial Areas	Ground/broadcast and drench	0.25-1.0	ns	ns	as	The labels do not provide restrictions on the maximum number of applications per year or the minimum retreatment interval.
Ornamentals	Ground/broadcast, basal spray and drench	0.92-4.0	ns	ns	7	Several labels only specify dilution factors (e.g. 8/100 gal) and do not provide application rates in lb a.i./a for uses including trunk drenches, stump treatment and sprays. Several labels do not specify seasonal or yearly maximum application rates. Most labels do not specify a minimum retreatment interval.
Christmas Trees	Ground/broadcast and drench	3/100 gal water Cut Tree Dip 1.0 Foliar	3	3	7	The application rate for the cut tree dip is provided as a dilution factor so the amount a.i./a cannot be determine for a single or yearly application rate.
Sorghum	Aerial or ground/ broadcast and	0.25-1.0	1.5*	3*	10	There is restricted use on sweet varieties of sorghum.

Crop/Site	Application Type/ Method	Single Application Rate Range (lb a.i./A)	Maximum Application Rate Per Year[b] (lb a.i./A)	Maximum Application Number	Minimum Retreatment Interval (days)	Comments
	chemigation					
Soybean	Aerial or ground/ broadcast and chemigation	0.25-1.0 Foliar 0.5-1.0 Soil	3.0*	3	10	Some labels do not specify the application interval.
Strawberries	Aerial or ground/ broadcast	2.0 Pre-plant 1.0 Foliar 1.0 Post-harvest	2.0 Preplant 2.0 Foliar Post-harvest **Total: 4.0**	1 Preplant 2 Foliar and Post-harvest (combined) **Total: 3**	10	Some of the labels are written as a pre-bloom (only); however, application types listed within the subsection include pre-pant, foliar and post-harvest. The label suggests that pre-plant applications be incorporated; however, an incorporation depth is not provided.
Sugar Beets	Aerial or ground/ broadcast	0.5 Pre-plant 0.25-1.0 Post Plant	3.0*	3*	10	Preplant application includes incorporation (1-2 inches).
Sunflowers	Aerial or ground/ broadcast and soil incorporation	1.0-2.0 Pre-plant 0.5-1.5 Post-emergence	2.0 Pre-plant 3.0 Post-emergence **Total: 3.0**	1 Pre-plant 2 Post-emergence **Total: 3**	7	Pre-plant application includes incorporation (2-4 inches). There is inconsistent language on some of the labels on the minimum retreatment interval. For example, 66222-19 (pg. 14) the text states "a second treatment may be made 7 to 10 days later if needed. Do not make a second application within 10 days of the first application."
Sweet Potatoes	Aerial or ground/	2.0	2.0	1		

Crop/Site	Application Type/ Method	Single Application Rate Range (lb a.i./A)	Maximum Application Rate Per Year[b] (lb a.i./A)	Maximum Application Number	Minimum Retreatment Interval (days)	Comments
	broadcast					
Tobacco	Aerial or Ground/ broadcast	1.0	2.0*	1*		The label specifies 2 inch incorporation after application.
Turf Grass (sod)	Aerial or ground/ broadcast	0.92-4.0	ns	ns	ns	Labels do not provide restrictions on the maximum number of applications per year or the minimum retreatment interval.
Outside Surfaces (e.g building perimeter).	Ground/broadcast	1	ns	ns	ns	Applications can be to a height on 2-3 feet on structures and from 6 to 10 feet wide. No retreatment information is provided on the label.
Walnut	Aerial or ground/ broadcast	2.0 Dorman/Delayed Dormant 1.0-4.0 Orchard Floor 2.0 Foliar	2.0* Dorman/Delayed Dormant 4.0* Orchard Floor 4.0* Foliar **Total: 10.0**	2* Dorman/Delayed Dormant 2* Orchard Floor 2* Foliar **Total: 6**	10	Labels permit multiple types of applications in one walnut orchard.
Wheat	Aerial or ground/ broadcast and chemigation	0.25-0.5	1.0*	2*		

* seasonal application restrictions

Previous Drinking Water Assessments

Several drinking water assessments (DWAs) have been completed for chlorpyrifos. Previous assessments relied upon Tier I groundwater and Tier II surface water modeling. As part of the 2002 Interim Reregistration Eligibility Decision which eventually became the Reregistration Eligibility Decision (RED), a drinking water exposure assessment was completed. This exposure assessment included a review of surface and groundwater monitoring data as well as model estimations for both chlorpyrifos and a known environmental degradation product, 3,5,6-trichloro-2-pyridinol (TCP). No monitoring data or model estimations were considered for chlorpyrifos-oxon in this exposure assessment. Since the RED, several drinking water assessments have been completed for proposed new uses of chlorpyrifos (DP 336295, 344311, 344526 and 357900). These assessments took into account chlorpyrifos, TCP and chlorpyrifos-oxon. Recent DWAs have only taken into account chlorpyrifos and chlorpyrifos-oxon (e.g. DP 381378). The focus on particular degradates of concern has changed over time in response to additional toxicology and exposure information.

In previous DWAs, estimated drinking water concentrations (EDWCs) for surface water have provided the highest exposure values, with the exception of groundwater monitoring data for wells that had been contaminated by use of chlorpyrifos as a termiticide. This use has since been cancelled. EDWCs for surface water reported in the RED and remodeled in a 2007 DWA (DP 336295) are summarized in **Table 5**.

Table 5. Previously Reported Estimated Drinking Water Concentration of Chlorpyrifos

Crop Scenario	Chlorpyrifos (ppb)		
	1-in-10 Year Peak	1-in-10 Year Annual Average	30 Year Average
RED Drinking Water Assessment			
Tobacco[1]	77.91	18.96	14.26
2007 Reevaluation of RED Modeling (updated tobacco label)			
Tobacco	36.73	6.89	4.72

1. RED values were previously reported for the farm pond (30.6 µg/L 1-in-10 Year Peak). The values reported here have been adjusted for the index reservoir.

Environmental Fate Assessment

The environmental fate database for chlorpyrifos is largely complete. Abiotic hydrolysis is not expected to play a significant role in chlorpyrifos dissipation; however, under alkaline conditions (pH 9), laboratory studies show chlorpyrifos is susceptible to hydrolysis with a half-life of approximately two weeks. Laboratory studies suggest that volatilization and photogradation are not likely to play a significant role in the dissipation of chlorpyrifos in the environment. Nonetheless, chlorpyrifos has been detected in air samples, so volatilization may play more of a role in dissipation than laboratory studies indicate. The major route of dissipation of chlorpyrifos appears to be aerobic and anaerobic metabolism. Based on available data, chlorpyrifos degrades

slowly in soil under both aerobic and anaerobic conditions. Degradation begins with cleavage of the phosphorus ester bond to yield 3,5,6-trichloro-2-pyridinol (TCP) as shown in **Figure 3**. TCP is also a degradation product of triclopyr (PC 116002). Aerobic and anaerobic soil metabolism studies also suggest TCP can be converted to 3,5,6-trichloro-2-methoxypyridine (TMP) as shown in **Figure 3**. TMP was not observed at concentrations greater than 10% and is not further discussed in this assessment. The half-life in aerobic aquatic conditions is approximately one month while anaerobic aquatic metabolism half-lives range from 39 to 51 days. The aquatic metabolism data suggest that chlorpyrifos partitions to soil/sediment while its degradation products are more likely to partition to water. Laboratory adsorption/desorption studies indicate leaching of chlorpyrifos is not likely. Chlorpyrifos was not detected at soil depths greater than six inches in field dissipation studies, further supporting that chlorpyrifos is not likely to leach through the soil. Yet, under certain use scenarios chlorpyrifos has been detected in groundwater.[10] Field dissipation studies show that chlorpyrifos is moderately persistent with a half-life of less than 60 days. Chlorpyrifos is slightly soluble in water but once it reaches aquatic environments the Log K_{ow} indicates that chlorpyrifos may bioaccumulate in fish and other aquatic organisms. A fish bioaccumulation study shows that chlorpyrifos is absorbed by fish; however, it rapidly depurates when exposure ceases. Environmental fate properties of chlorpyrifos are summarized in **Table 6**. It is unclear how formulation impacts the dissipation of chlorpyrifos in the environment. Specifically, it is unknown if the granular or encapsulated formulations slow the dissipation of chlorpyrifos in the environment.

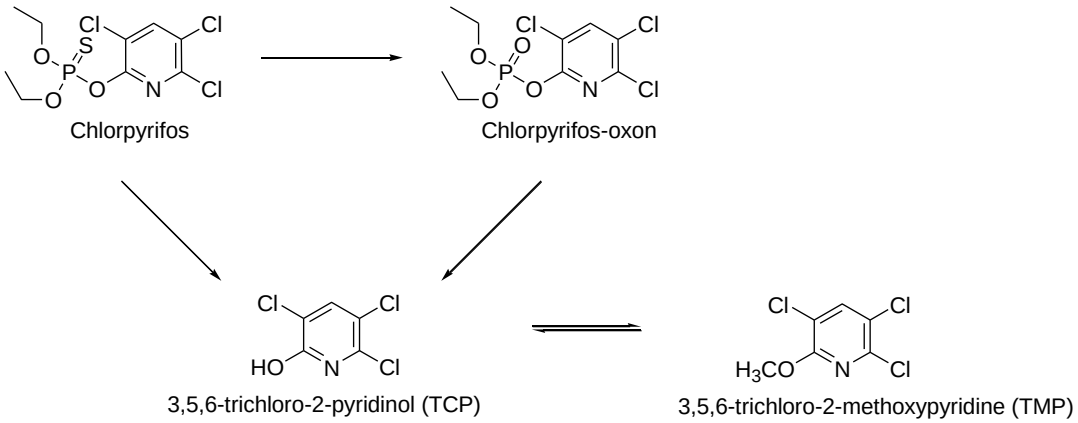


Figure 3. Environmental Transformation of Chlorpyrifos

Table 6. Environmental Fate and Transport Characteristics of Chlorpyrifos

Parameter	Data	Study ID	Study Status
Hydrolysis Half-life ($t_{1/2}$)	pH 5: 73 days pH 7: 72 days pH 9: 16 days	MRID 00155577 Acc. 260794	Acceptable
	pH 7: 81 days	MRID 40840901	Acceptable
Aquatic Photolysis Half-life ($t_{1/2}$)	29.6 days @ pH 7	MRID 41747206	Acceptable
Soil Photolysis	Stable	MRID 42495403	Supplemental

10 These detections are associated with termiticide uses which have been cancelled.

Parameter	Data	Study ID	Study Status
Half-life ($t_{1/2}$)	180 days	MRID 42144911	Acceptable
Aerobic Soil Metabolism Half-life ($t_{1/2}$)	107, 11, 22, 102, 24, 34 and 141 days	Acc. 241547 MRID 42144911	Acceptable
Aerobic Aquatic Metabolism Half-life ($t_{1/2}$)	30.5 days	MRID 44083401	Scientifically Valid[1]
Anaerobic Soil Metabolism half-life ($t_{1/2}$)	15 and 58 days	MRID 00025619	Acceptable
Anaerobic Aquatic Metabolism half-life ($t_{1/2}$)	39 and 51 days	MRID 00025619	Supplemental[2]
Adsorption Coefficient (K_d)	49.9, 65.6 and 99.7	Acc. 260794	Acceptable
Soil Partition Coefficient (K_{oc})	7300, 5860 and 4960 mL/g	Acc. 260794	Acceptable
Terrestrial Field Dissipation	33 to 56 days 1.3-4, 7.3-<27 and 1.4-<32 days 6.5-11.4 days and secondary phase (days 28-120) half-lives of 24-38.3 days	MRID 4005900	Acceptable

1. Previous risk assessments and the problem formulation developed for Registration Review indicate that no aerobic aquatic metabolism data are available; however, one study (MRID 44083401) was located during the review process. No data evaluation record or classification for this study was found. Preliminary evaluation indicates that although there are several study deviations, this study is scientifically valid. The study is undergoing a thorough review. The value listed in the table is the value reported by the author in the study report.
2. Previous risk assessments and the problem formulation developed for Registration Review indicate that no anaerobic aquatic metabolism data are available. During the review process one study (MRID 00025619) was located. This study was originally classified as acceptable for anaerobic aquatic metabolism. At this time, this study is being reclassified as supplemental as there are several study deficiencies; however, the study provides useful information.

Environmental fate studies submitted to EPA supporting the registration of chlorpyrifos do not identify chlorpyrifos-oxon as a transformation product. It is unclear if the analytical methods used in these studies were adequate for identification; however, chlorpyrifos-oxon was not used as a reference standard in these experiments. Organophosphates that contain a phosphothionate group (P=S) such as chlorpyrifos are known to transform to the corresponding oxon analogue which contains a phosphorus-oxygen double bond (P=O) instead. [3,11,12] This transformation occurs via oxidative desulfonation. Oxidation of chlorpyrifos to chlorpyrifos-oxon is shown in **Figure 3**. EPI Suite (v.4.00) was used to estimate the physical/chemical properties of chlorpyrifos-oxon as shown in **Table 7**. Oxidation of organophosphates has been shown to occur through photolysis, aerobic metabolism and chlorination as well as other oxidative processes. For

11 Wu, J.; Laird, D. A. Abiotic Transformation of Chlorpyrifos to Chlorpyrifos Oxon in Chlorinated Water. *Environ. Toxcol.Chem.*, **2003**, 22(2), 261-264.

12 Tierney, D. P.; Christensen, B. R.; Culpepper, V. C. Chlorine Degradation of Six Organophosphate Insecticides and Four Oxons in Drinking Water Matrix. *Submitted by Syngenta Crop Protection, Inc.* **2001**.

chlorpyrifos, water purification (chlorination) has been shown to be a major route of chlorpyrifos-oxon formation.[3,11,12] This transformation has been shown to proceed via rapid oxidation by the oxychlorine species used in water treatment and water treatment simulations have shown that chlorpyrifos-oxon is the primary degradation product of chlorpyrifos. This transformation is almost quantitative. Once formed, chlorpyrifos-oxon has been shown to be relatively stable ($t_{1/2}$ = 12 days) under typical water purification conditions (pH 8).[13]

Table 7. Physical/Chemical Properties Chlorpyrifos-oxon

Parameter	Chlorpyrifos-oxon	Source
Molecular Weight	334.52 /mol	ChemDraw Ultra
Water Solubility	26.0 mg/L	EPI Suite (v4.00)
Vapor Pressure (25 °C)	$6.65x10^{-6}$ torr	EPI Suite (v4.00)
Henry's Law Constant	5.5×10^{-9} atm - m^3/mol	estimated EPI Suite (v4.00)
Log (K_{ow})	2.89 mg/L	estimated EPI Suite (v4.00)

Chlorpyrifos-oxon has been detected in environmental samples including surface water, precipitation and air.[14,15,16,17] For example, one study found higher concentrations of chlorpyrifos-oxon than chlorpyrifos (ratio of 5.6:3.9) in air samples.[17] There are several literature studies that underscore the potential for chlorpyrifos-oxon formation. Photodegradation of chlorpyrifos to chlorpyrifos-oxon in solution as well as on glass, plant and soil surfaces has been observed.[18,19] Chlorpyrifos-oxon has been shown to undergo hydrolysis faster than chlorpyrifos. The hydrolysis half-life of chlorpyrifos-oxon is substantially shorter than that observed for chlorpyrifos.[3] Chlorpyrifos-oxon hydrolyses to form TCP, a major environmental degradation product reported for chlorpyrifos. A recent memo discusses the possible formation of chlorpyrifos-oxon in the environment (DP 380682). Additional studies on chlorpyrifos-oxon were requested in EPA's final work plan for the Registration Review of Chlorpyrifos (September

13 pH 8 and residual chlorine concentration of 1 ppm.

14 Landers, D. H.; Simonich, S. L.; Jaffe, D. A.; Geiser, L. H.; Campbell, D. H.; Schwindt, A. R.; Schreck, C. B.; Kent, M. L.; Hafner, W. D.; Taylor, H. E.; Hageman, K. J.; Usenko, S.; Ackerman, L. K.; Schrlau, J. E.; Rose, N. L.; Blett, T. F; Erway, M. M.; The fate, transport, and ecological impacts of airborne contaminants in Western National Parks (USA) U.*S. Environmental Protection Agency Report EPA/600/R-07/138*, **2008**, http://www.epa.gov/nheerl/wacap

15 LeNoir, J. S.; McConnell, L.L; Fellers, G. M; Cahill, T. M; Seiber, J. N. Summertime Transport of Current-use pesticides from California's Central Valley to the Sierra Nevada Mountain Range, USA. *Environ. Toxicol. Chem.* **1999**, *18*, 2715-2722.

16 Sparling, D. W.; Fellers, G. M.; McConnell, L. L. Pesticides and amphibian population declines in California, *Environ. Toxicol. Chem.* **2001**, *20*, 1591-1595.

17 Glotfelty, D. E.; Majewski, M. S.; Selber, J. N. Distribution of Several Organophosphorus Insecticides and Their Oxygen Analogues in a Foggy Atmosphere. *Environ. Sci. Technol.*, **1990**, *24 (3)*, 353-357.

18 Kralj , M. B.; Franko, M. Trebse. Photodegradation of Organophosphorus Insecticides – Investigations of Products and Their Toxicity Using Gas Chromatography-Mass Spectrometry and AChE-thermal Lens Spectrometric Bioassay. *Chemosphere*, **2007**, *67*, 99-107.

19 Walia, S.; Dureja, P.; Mukerjee, S. K. *Arch. Environ. Contam. Toxicol.* **1988**, *17*, 183-188.

2009). EFED expects to receive aerobic soil metabolism, adsorption/desorption (batch equilibrium) and field volatility data for chlorpyrifos-oxon within the next year. Environmental fate properties of chlorpyrifos-oxon are shown in **Table 8**.

Table 8. Environmental Fate Properties of Chlorpyrifos-oxon

Parameter	Chlorpyrifos-oxon	Source
Hydrolysis Half-life ($t_{1/2}$) pH=7	13.2 days	Environ. Sci. Technol. **2006**, *40*, 546-551
Aqueous Photolysis Half-life ($t_{1/2}$)	< chlorpyrifos	Chemosphere 2007; Arch. Environ. Contam. Toxicol. 1998
Aerobic Soil Metabolism Half-life ($t_{1/2}$)	No data	
Aerobic Aquatic Metabolism Half-life ($t_{1/2}$)	No data	
Anaerobic Soil Metabolism ($t_{1/2}$)	No data	
Anaerobic Aquatic Metabolism ($t_{1/2}$)	No data	
Soil Adsorption Coefficient K_{oc}	No data	

Conceptual Model

Chlorpyrifos applications can lead to surface water contamination as a result of spray drift as well as through runoff and sediment erosion. The soil/water partitioning of chlorpyrifos indicates that chlorpyrifos runoff is generally by soil erosion rather than dissolution in runoff water. Based on the fate properties of chlorpyrifos it may be persistent in the environment for several weeks to months post-application. Once in aquatic environments, chlorpyrifos is likely to persist for at least several months. These data suggest, along with monitoring data, that runoff via dissolved phase and eroded sediment, spray drift, and volatilization are probable environmental transport mechanisms for chlorpyrifos and chlorpyrifos-oxon. An illustration highlighting possible environmental dissipation routes is shown in **Figure 4**.

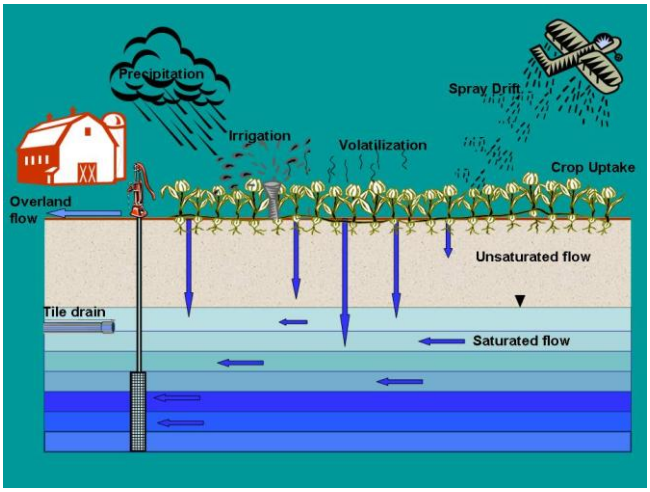


Figure 4. Routes of Pesticide Dissipation in the Environment

Analysis

Tier I groundwater estimated drinking water concentrations (EDWCs) for chlorpyrifos and chlorpyrifos-oxon were calculated using SCI-GROW (Screening Concentration in Groundwater, version 2.3, August 8, 2003). SCI-GROW was developed by fitting a linear model to groundwater concentrations with the Relative Index of Leaching Potential (RILP) as the independent variable. Groundwater concentrations were taken from 90-day average high concentrations from Prospective Groundwater studies; the RILP is a function of aerobic soil metabolism and the soil-water partition coefficient. The output of SCI-GROW represents the concentrations that might be expected in shallow unconfined aquifers under sandy soils, which is representative of the groundwater most vulnerable to pesticide contamination likely to serve as a drinking water source.

Tier II surface water EDWCs for chlorpyrifos and chlorpyrifos-oxon resulting from chlorpyrifos use on a variety of crops were calculated using PRZM (Pesticide Root Zone Model, version 3.12.3, June 2006) and EXAMS (EXposure Analysis Modeling System, version 2.98.04.06, April 2005) models in the PE5 shell. PRZM is used to simulate pesticide transport as a result of runoff and erosion from an agricultural field. EXAMS estimates environmental fate and transport of pesticides in surface water.

All Tier II modeling was corrected for percent cropped area (PCA), an adjustment factor used to account for the percentage of a watershed that is planted with a crop or set of crops, recognizing that in many cases a watershed that is large enough to support a drinking water facility will not usually be planted completely with a single crop or a small set of crops. When applications include non-agricultural use such as turf, no adjustment is made, (i.e. the PCA = 1) as the Geographic Information System (GIS) coverage used to develop the PCA adjustment factors represents only agricultural land.[20] Since chlorpyrifos is registered for use on turf (including sod

20 Jones, R. D.; Costello, K.; Hetrick, J.; Lin, J.; Parker, R.; Thurman, N.; Peck, C.; Orrick, G. *Development of Use od Percent Cropped Area Adjustment Factors in Drinking Water Expsure Assessments.* U.S. Environmental Protection Agency, Sept. 9, 2010.

farms, golf courses, road medians and industrial areas) a percent cropped area (PCA) of 1 (considers 100% of the watershed is treated) was applied to surface water modeling results for national assessment. EFED continues to work on developing additional crop specific PCA values, including one for turf. Should the turf PCA become final before the completion of this drinking water assessment, the new PCA will be used in the final assessment. If chlorpyrifos was not registered for use on turf, a PCA value of 0.87 (87% of the watershed treated) would have been used based on the other registered uses; reducing the EDWCs by 13%.

Since there are limited environmental fate data available for chlorpyrifos-oxon and chlorpyrifos is expected to oxidize to chlorpyrifos-oxon during drinking water treatment, EDWCs for chlorpyrifos-oxon were derived from EDWCs calculated for chlorpyrifos. This was done by multiplying chlorpyrifos EDWCs by 0.9541 (molecular weight of chlorpyrifos-oxon/molecular weight of chlorpyrifos) and 100% (maximum possible conversion of chlorpyrifos to chlorpyrifos-oxon in the environment and during water purification). The reported groundwater chlorpyrifos-oxon EDWCs are representative of drinking water supplies that utilize oxidative treatment methods such as chlorination. In general, drinking water taken from private wells is not treated; however, community drinking water supplied by wells may be treated with chlorine in order to protect drinking water during distribution. The maximum conversion of chlorpyrifos to chlorpyrifos-oxon (100%) under typical drinking water treatment conditions was used for the following reasons:

- Empirical data show chlorpyrifos rapidly oxidizes to form chlorpyrifos-oxon quantitatively during drinking water treatment. [3]
    - The conversion of chlorpyrifos to chlorpyrifos-oxon via oxidation is significantly faster than the hydrolysis of chlorpyrifos to TCP at pH 8. [3]

- Chlorpyrifos-oxon is not expected to degrade to a great extent between drinking water purification and consumer consumption (drinking water distribution).
    - Water distribution time periods typically range from a few hours to a few days; this is several days less than the estimated hydrolysis half-life of chlorpyrifos-oxon.
        - Experimental data indicate that chlorpyrifos-oxon is relatively stable to hydrolysis at pH 8 as highlighted in **Figure 5**.[3] The observed half-life of chlorpyrifos-oxon is 12 days at pH 8.[3]
    - Empirical data suggest >80% of chlorpyrifos is present as the oxon at 5 days post drinking water treatment and <20% is present as TCP. A comparison of the amount of chlorpyrifos, chlorpyrifos-oxon and TCP following drinking water treatment is presented as a function of time in **Figure 6**.[3]

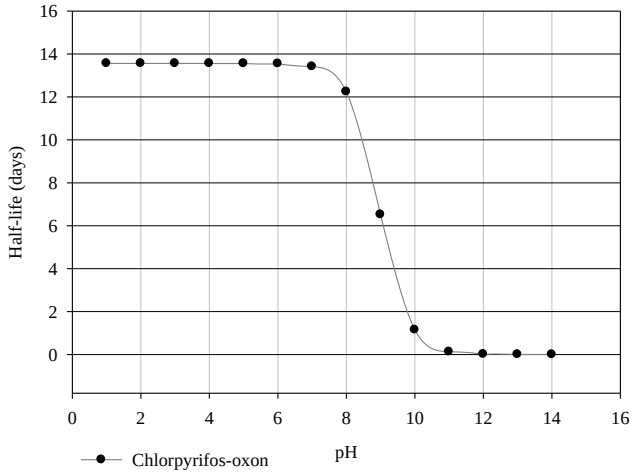


Figure 5. Hydrolysis of Chlorpyrifos-oxon as a Function of pH; Results are based on the hydrolysis rate constants reported in a drinking water purification simulation experiment.

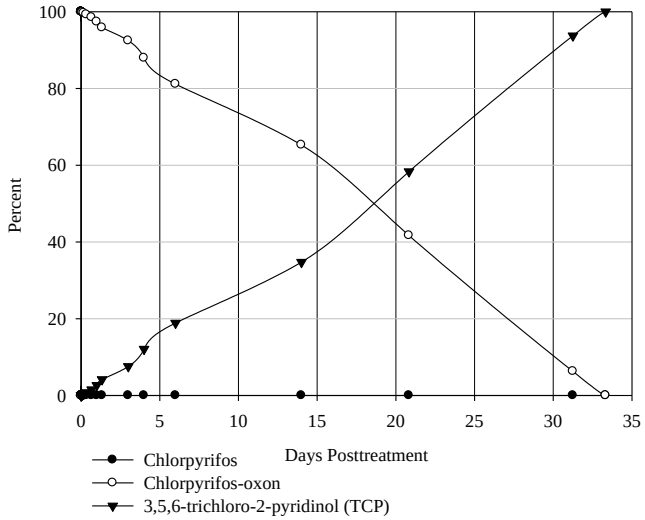


Figure 6. Comparative Analysis of Chlorpyrifos and Its Transformation Products Following Drinking Water Treatment; Results are based on the transformation rate constants reported for chlorpyrifos and chlorpyrifos-oxon presented in a bench top drinking water treatment simulation experiment (pH 8).[3] The oxidation rate for chlorpyrifos is significantly higher than the rates of hydrolysis; therefore, all chlorpyrifos is expected to be instantaneously converted to chlorpyrifos-oxon. The concentration of oxychlorine is assumed to be constant and its contribution to reactions other than oxidation of chlorpyrifos to chlorpyrifos-oxon is considered negligible based on reported rate constants.

It is possible that some drinking water treatment procedures such as use of granular activated carbon filtration and water softening may reduce the amount of chlorpyrifos-oxon in drinking water.[4] Based on laboratory data, alkaline pH >10 (water softening) will significantly increase the rate of chlorpyrifos-oxon hydrolysis. Water softening is not a method commonly practiced

throughout the country for surface water. Therefore, adjustment of the 100% conversion factor to account for degradation under such conditions is not appropriate. No data are available on the removal efficiency of chlorpyrifos-oxon during water treatment processes.

Selecting Input Parameters

The input parameters used in this DWA were selected from the environmental fate data submitted by various registrants in accordance with US EPA-OPP Environmental Fate and Effects Division's (EFED) water model parameter guidance.[21] Note that uncertainties exist in choosing input parameters. For this reason, this assessment incorporates all scientifically available data to provide estimates for chlorpyrifos and chlorpyrifos-oxon concentrations resulting from chlorpyrifos use. Each input value was calculated according to the input parameter guidance as detailed below. Data sources as well as the input values used in the model runs for SCI-GROW and PRZM-EXAMS are summarized in **Table 9**.

Water Solubility

The water solubility of chlorpyrifos has been reported to be between 0.5-2.0 mg/L for temperatures between 20-25 °C. Based on data submitted to EPA, 1.4 mg/L was used in modeling.

Soil Partition Coefficient

Registrants have provided data necessary to determine that soil binding for chlorpyrifos is correlated with organic carbon content (i.e., the coefficient of variation for K_{oc} values is less than that for K_d values). The mean K_{oc} value of 6040 for chlorpyrifos was used in PRZM-EXAMS modeling while the median K_{oc} value of 5860 was used in SCI-GROW modeling.

Aerobic Soil Metabolism Half-life

The 90th percentile confidence bound on the mean chlorpyrifos half-life value is 77.6 + [(1.415 x 63.5)/√8)] = 109 days. This value is used in PRZM-EXAMS modeling. The median half-life value of 68 days was used in SCI-GROW modeling.

Anaerobic Soil Metabolism Half-life

The 90th percentile confidence bound on the mean chlorpyrifos half-life value is 36.5 + [3.078 x 30.4)/√2)] = 103 days. This value is used in PRZM-EXAMS modeling.

Aerobic Aquatic Metabolism Half-life

Only one half-life value (MRID 44083401) is available so this value (30.5 days) was multiplied by three to get 91.5 days. This value is used in PRZM-EXAMS modeling.

21 *Guidance for Selecting Input Parameters in Modeling the Environmental Fate and Transport of Pesticides*, Version 2.1, October 22, 2009.

Table 9. Input Parameters Used in SCI-GROW and PRZM-EXAMS Modeling to Estimate Chlorpyrifos Drinking Water Concentrations.

Parameter	Values for Chlorpyrifos/ Comments	Source
Vapor Pressure (25 °C)	1.87×10^{-5} torr	CRLF assessment, Oct. 16, 2009 product chemistry BC 2062713
Water Solubility (20 °C)	1.4 mg/L	MRID 41829006
Molecular Weight	350.57 g/mol	product chemistry
Henry's Law Constant	6.2×10^{-6} atm - m^3/mol	calculated
Hydrolysis ($t_{1/2}$)	81 days maximum value of 72 and 81 days	MRIDs 00155577 and 40840901
Aqueous Photolysis ($t_{1/2}$)	29.6 days	MRID 41747206
Aerobic Soil Metabolism ($t_{1/2}$)	SCI-GROW: 68 days median half-life value. PRZM-EXAMS: 109 days upper 90th percentile confidence bound on the mean half-life value. $t_{1/2}$ =107, 11, 22, 102, 24, 34, 141 and 180 days	Acc. # 241547 and MRID 42144911
Aerobic Aquatic Metabolism ($t_{1/2}$)	91.5 days 3x the one half-life value (30.5 days)	MRID 44083401
Anaerobic Soil Metabolism ($t_{1/2}$)	103 days upper 90th percentile confidence bound on the mean half-life value of 15 and 58 days	MRID 00025619
Anaerobic Aquatic Metabolism ($t_{1/2}$)	63 days upper 90th percentile confidence bound on the mean half-life value of 39 and 51 days	MRID 00025619
Soil Adsorption Coefficient K_{oc}	SCI-GROW: 5860 median K_{oc} value PRZM-EXAMS: 6040 mL/g mean K_{oc} value. K_{oc} values = 7300, 5860 and 4960 mL/g	Acc. # 260794
Spray Drift	3.9% (aerial) 1.9% (air-blast) 1.0% (ground) 0.0% (granular)	AgDRIFT modeling based on label restrictions

Anaerobic Aquatic Metabolism Half-life

The 90th percentile confidence bound on the mean chlorpyrifos half-life value is $45 + [(3.078 \times 8.5)/\sqrt{2})] = 63$ days. This value is used in PRZM-EXAMS modeling.

PRZM-EXAMS Model Scenario

Several specific chlorpyrifos use scenarios were developed and modeled using PRZM-EXAMS based on currently registered uses of chlorpyrifos as reported on the EFED label data report as well as some recently revised labels. This DWA also considers recent revisions to chlorpyrifos labels (labels updated since 2/6/2009 as noted) for completeness. Spray drift fractions were determined for both aerial and ground applications based on the required buffer zones using AgDRIFT. For uses that permit both aerial and ground applications, only aerial applications were modeled, as the AgDRIFT results suggest aerial application results in the highest spray drift. When more than one standard scenario exists for a given crop group or subgroup, all are modeled. The standard scenarios (crop, location and meteorological data) application rate, interval and date used in PRZM-EXAMS modeling are shown in **Table 10**. Due to the ambiguity of some of the current labels, several assumptions were made (see list below). Specific rationales behind assumptions made to complete modeling are discussed in **Table 10**, as necessary. A few general assumptions are listed below.

- Maximum application rates and minimum application retreatment intervals allowed on the labels were used for modeling, unless otherwise noted. When typical application rates scenarios were modeled, if the application number exceeded an integer (e.g., 1.3) the number of applications was assumed to be the next highest integer (i.e., 2).[22]

- When the label does not recommend an application date or range, meteorological data, crop profiles, as well as best professional judgment, were used to establish an application date. For some use scenarios, several application dates were evaluated and the date that provided the most conservative EDWCs was used.

- When more than one standard scenario exists for a given crop, all may have been modeled; however, only the scenario providing the most conservative EDWC is reported, unless otherwise noted.

- If multiple types of applications are allowed on one crop within one year, such as pre-plant or soil incorporation along with a foliar application(s), all applications were assumed to be foliar applications. Additional modeling can be completed to take into account the different types of agricultural practices; however, the reported values are expected to be conservative. Additional modeling may reduce the EDWCs slightly**.**

Groundwater

Tier I groundwater EDWCs are not expected to be greater than 1.1 and 1.0 µg/L for chlorpyrifos or chlorpyrifos-oxon, respectively.[6] All EDWCs for groundwater are shown by chlorpyrifos use in **Table 11**.

22 Typical use rates provided by BEAD email 6/10/2011

Table 10. Scenario Specific Input Parameters Used in PRZM-EXAMS Modeling to Estimate Chlorpyrifos and Chlorpyrifos-oxon Concentrations Resulting From the Registered Uses of Chlorpyrifos

Input Parameter (Symbol; Unit)	Value Used		Reference
Alfalfa			
CAM	2	Aerial spray, foliar application	EFED Guidance
Application Type and Depth of Incorporation	0	Aerial application	EFED Guidance
Spray Drift Fraction	0.039	Aerial application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.95	Aerial application	EFED Guidance
Number of Applications/Application Rate[2]	4/1.1 kg ai/ha		Registered Labels, LUIS report 2/6/2009
Interval Between Applications	10 days		Registered Labels, LUIS report 2/6/2009
Location Specific Crop Scenarios and Application Date	TX alfalfaOP, w13958 May 15 IDNpotato_WirringSTD, w24156 July 15		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles,[1] PRZM-EXAM Scenario Profiles and Meteorological Data.
Almonds			
CAM	2	aerial spray, foliar application	EFED Guidance
Application Type and Depth of Incorporation	0	Aerial application	EFED Guidance
Spray Drift Fraction	0.039	Aerial application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.95	Aerial application	EFED Guidance
Number of Applications/Application Rate[2]	1/1.1 (dormant/delayed dormant), 1/4.5 (orchard floor) and 2/2.2 kg ai/ha (foliar)		Registered Labels, LUIS report 2/6/2009 The label allows dormant/delayed dormant, trunk spray, floor applications to almonds. All three types of applications were assumed to occur in one growing season and were modeled together. It is unclear if both an orchard floor and a trunk spray are permitted and for modeling purposes only orchard floor application was assumed. The trunk drench applications rate is provided as a dilution factor.
Interval Between Applications	60 (following dormant application) and 10 days		Registered Labels, LUIS report 2/6/2009
Location Specific Crop Scenarios and Application Date	CAalmond_WirringSTD, w23232 Jan. 1		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles,[1] PRZM-EXAM Scenario Profiles and Meteorological Data.

Input Parameter (Symbol; Unit)	Value Used		Reference
Apples			
CAM	1	Ground spray, trunk application	EFED Guidance
Application Type and Depth of Incorporation	0	Ground application	EFED Guidance
Spray Drift Fraction	0.01	Ground application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.99	Ground application	EFED Guidance
Number of Applications/Application Rate[2]	2/2.2 kg ai/ha (dormant) 2/1.7 kg ai/ha (trunk)		Registered Labels, LUIS report 2/6/2009, Usage Data 2006-2010[2]
Interval Between Applications	na 30 days		Registered Labels, LUIS report 2/6/2009
Location Specific Crop Scenarios and Application Date	NCappleSTD, w03812 Jan. 1 Aug. 15 July 16		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles (dogwood borer: 7/15 - 8/15 for PA),[1] PRZM-EXAM Scenario Profiles and Meteorological Data.
Asparagus			
CAM	1 2	Ground application, post harvest granular Aerial spray, foliar application	EFED Guidance
Application Type and Depth of Incorporation	0	Ground/Aerial application	EFED Guidance
Spray Drift Fraction	0 0.039	Ground granular application Aerial liquid application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	1 0.95	Granular application Aerial application	EFED Guidance
Number of Applications/Application Rate[2]	2/1.7 kg ai/ha (granular) 3/1.1 kg ai/ha		Registered Labels, LUIS report 2/6/2009 The label permits 1 pre-harvest or 2 post-harvest applications per season.
Interval Between Applications	10 days		Registered Labels, LUIS report 2/6/2009
Location Specific Crop Scenarios and Application Date	MIAsparagusSTDv2, w14840 May 15		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles,[1] PRZM-EXAM Scenario Profiles and Meteorological Data.
Cherries			
CAM	2	Ground spray, foliar application	EFED Guidance

Input Parameter (Symbol; Unit)	Value Used		Reference
Application Type and Depth of Incorporation	0	Ground application	EFED Guidance
Spray Drift Fraction	0.01	Ground application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.99	Ground application	EFED Guidance
Number of Applications/Application Rate[2]	8/1.7 kg ai/ha 2/1.7 kg ai/ha (average typical rate)		Registered Labels, LUIS report 2/6/2009, Usage Data 2006-2010[2]
Interval Between Applications	10 days		Registered Labels, LUIS report 2/6/2009
Location Specific Crop Scenarios and Application Date	MICherriesSTD, w14850 May 15		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles,[1] PRZM-EXAM Scenario Profiles and Meteorological Data.
Christmas Tree			
CAM	2	Ground spray, foliar application	EFED Guidance
Application Type and Depth of Incorporation	0	Ground application	EFED Guidance
Spray Drift Fraction	0.01	Ground application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.99	Ground application	EFED Guidance
Number of Applications/Application Rate[2]	3/1.1 kg ai/ha		Registered Labels, LUIS report 2/6/2009
Interval Between Applications	7 days		Registered Labels, LUIS report 2/6/2009
Location Specific Crop Scenarios and Application Date	ORXmasTreeSTD, w24232 Aug. 1 PAappleSTD_V2, w14751 Aug. 1		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles,[1] PRZM-EXAM Scenario Profiles and Meteorological Data.
Citrus			
CAM	2	Ground spray, foliar application	EFED Guidance
Application Type and Depth of Incorporation	0	Ground application	EFED Guidance
Spray Drift Fraction	0.01 0.039	Ground application Aerial application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.99 0.95	Ground application Aerial application	EFED Guidance

Input Parameter (Symbol; Unit)	Value Used		Reference
Number of Applications/Application Rate[2]	2/3.9 (foliar) and 3/1.1 kg ai/ha (orchard floors) 1/3.9 kg ai/ha (foliar; average typical rate for lemons) 2/2.8 kg ai/ha (foliar; average typical rate for oranges)		Registered Labels, LUIS report 2/6/2009, Usage Data 2006-2010[2] The label allows foliar and floor applications to citrus. Both types of applications were assumed to occur in one growing season and were modeled together. Note that, higher foliar application rate (4.5 - 6.7 kg a.i./ha) is allowed in specific counties in California on some labels.
Interval Between Applications	30 days (after high rate) 10 days (after low rates)		Registered Labels, LUIS report 2/6/2009
Location Specific Crop Scenarios and Application Date	FLcitrusSTD, w12844 Aug. 10		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles, (chlorpyrifos application typically occur more than six months before harvest—harvest may occur during any month except July and August; most harvesting is expected to occur between January and March—corresponding application dates include April thru September),[1] PRZM-EXAMS Scenario Profiles and Meteorological Data.
Cole Crop			
CAM	2	Aerial spray, foliar application	EFED Guidance
Application Type and Depth of Incorporation	0	Aerial application	EFED Guidance
Spray Drift Fraction	0.039	Aerial application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.95	Aerial application	EFED Guidance
Number of Applications/Application Rate[2]	9/1.1 kg ai/ha		Registered Labels, LUIS report 2/6/2009 *In some locations it is possible to have multiple seasons per year. For modeling purposes three seasons were assumed per year; however, for some locations it could be possible to have more than three (3 ½-4 seasons per year).
Interval Between Applications	10 day; 90 days (after every third application)		Registered Labels, LUIS report 2/6/2009
Location Specific Crop Scenarios and Application Date	FLcabbageSTD, w12842 Jan. 1		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles,[1] PRZM-EXAM Scenario Profiles and Meteorological Data
Corn			
CAM	2	Aerial spray, foliar application Ground application (typical)	EFED Guidance
Application Type and Depth of Incorporation	0 4 cm	Aerial application Ground application (typical)	EFED Guidance

Input Parameter (Symbol; Unit)	Value Used		Reference
Spray Drift Fraction	0.039 0	Aerial application Ground incorporated application (typical)	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.95 1	Aerial application Ground incorporated application (typical)	EFED Guidance
Number of Applications/Application Rate[2]	3/1.1 kg ai/ha 1/1.0 kg ai/ha (typical use)		Registered Labels, LUIS report 2/6/2009 Usage Data 2006-2010[2]
Interval Between Applications	10 days		Registered Labels, LUIS report 2/6/2009
Location Specific Crop Scenarios and Application Date	KSCornStd, w13996 May 15		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles,[1] PRZM-EXAM Scenario Profiles and Meteorological Data.
Cotton			
CAM	2	Aerial spray, foliar application	EFED Guidance
Application Type and Depth of Incorporation	0	Aerial application	EFED Guidance
Spray Drift Fraction	0.039	Aerial application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.95	Aerial application	EFED Guidance
Number of Applications/Application Rate[2]	3/1.1 kg ai/ha		Registered Labels, LUIS report 2/6/2009
Interval Between Applications	10 days		Registered Labels, LUIS report 2/6/2009
Location Specific Crop Scenarios and Application Date	NCcottonSTD, w13722 May 15		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles,[1] PRZM-EXAM Scenario Profiles and Meteorological Data.
Grape			
CAM	1	Ground spray, soil application	EFED Guidance
Application Type and Depth of Incorporation	0	Ground application	EFED Guidance
Spray Drift Fraction	0.01	Ground application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.99	Ground application	EFED Guidance

Input Parameter (Symbol; Unit)	Value Used		Reference
Number of Applications/Application Rate[2]	1/37.3 kg ai/ha (drench; high rate) 1/6.7 kg ai/ha (drench; low rate) 2/2.5 kg ai/ha [average typical use for all grapes (raisin, table and wine)]		Registered Labels, LUIS report 2/6/2009 Usage Data 2006-2010[2] Note: No usage data is available for New York
Interval Between Applications	Not applicable		Registered Labels, LUIS report 2/6/2009
Location Specific Crop Scenarios and Application Date	NYGrapesSTD, w14860 CAgrapes_WirringSTD, w93193 May 15 July15 Feb. 28		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles [borer treatment mid-May (5/10-20) and mid-July (7/10-20)],[1] PRZM-EXAMS Scenario Profiles and Meteorological Data.
Legume Vegetables			
CAM	4	Ground spray, soil incorporated	EFED Guidance
Application Type and Depth of Incorporation	2.5	Ground application	EFED Guidance
Spray Drift Fraction	0.01	Ground application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.99	Ground application	EFED Guidance
Number of Applications/Application Rate[2]	1/1.1 kg ai/ha		Registered Labels, LUIS report 2/6/2009
Interval Between Applications	na		Registered Labels, LUIS report 2/6/2009
Location Specific Crop Scenarios and Application Date	MSsoybeanSTD, w03940 May 25		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles,[1] PRZM-EXAM Scenario Profiles, and Meteorological Data.
Mint			
CAM	2	Ground spray, foliar application	EFED Guidance
Application Type and Depth of Incorporation	0	Ground application	EFED Guidance
Spray Drift Fraction	0.01	Ground application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.99	Ground application	EFED Guidance
Number of Applications/ Application Rate[2]	3/2.2 kg ai/a		Registered Labels
Interval Between Applications	90 day		Registered Labels; no minimum retreatment interval is provide on the label; however, the label only permits one preplant application, one growing season application and one post harvest application.
Location Specific Crop Scenarios and Application Date	ORmintSTD, w24232 Apr. 30		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles,[1] PRZM-EXAMS Scenario Profiles and Meteorological Data.

Input Parameter (Symbol; Unit)	Value Used		Reference
Onion Bulbs			
CAM	2	Ground spray, foliar application	EFED Guidance
Application Type and Depth of Incorporation	0	Ground application	EFED Guidance
Spray Drift Fraction	0.01	Ground application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.99	Ground application	EFED Guidance
Number of Applications/ Application Rate[2]	2/1.1 kg ai/a 1/1.1 kg ai/a (average typical use)		Registered Labels, Usage Data 2006-2010[2]
Interval Between Applications	3 day		Registered Labels; no minimum retreatment interval is provide on the label; however, the label only permits one preplant application, one growing season application and one post harvest application.
Location Specific Crop Scenarios and Application Date	GAOnion_WirringSTD, w03822 Dec. 4		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles (planting dates November thru February were evaluated),[1] PRZM-EXAMS Scenario Profiles and Meteorological Data.
Peaches			
CAM	2	Ground spray, foliar application	EFED Guidance
Application Type and Depth of Incorporation	0	Ground application	EFED Guidance
Spray Drift Fraction	0.01	Ground application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.99	Ground application	EFED Guidance
Number of Applications/ Application Rate[2]	1/3.3 kg ai/a		Registered Labels
Interval Between Applications	na		Registered Labels
Location Specific Crop Scenarios and Application Date	GAPeachesSTD, w03813 Aug. 31		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles,[1] PRZM-EXAMS Scenario Profiles and Meteorological Data.
Peanut			
CAM	1 4	Aerial spray, soil application Ground spray, soil incorporated application	EFED Guidance
Application Type and Depth of Incorporation (cm)	0 7.6	Aerial application Ground application	EFED Guidance

Input Parameter (Symbol; Unit)	Value Used		Reference
Spray Drift Fraction	0.039 0.01	Aerial application Ground application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.95 0.99	Aerial application Ground application	EFED Guidance
Number of Applications/ Application Rate[2]	2/2.2 kg ai/a 1/2.2 kg ai/a		Registered Labels
Interval Between Applications	ns		Registered Labels
Location Specific Crop Scenarios and Application Date	NCPeanutSTD, w13722 May 31		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles,[1] PRZM-EXAMS Scenario Profiles and Meteorological Data.
Pecans			
CAM	2	Ground spray, foliar application	EFED Guidance
Application Type and Depth of Incorporation	0	Ground application	EFED Guidance
Spray Drift Fraction	0.01 0.039	Ground application Aerial application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.99 0.95	Ground application Aerial application	EFED Guidance
Number of Applications/Application Rate[2]	3/2.2 kg ai/ha (foliar) 1/4.5 kg ai/ha (orchard floor) 3/1.0 kg ai/ha (foliar; average typical use) 3/1.4 kg ai/ha (foliar; average typical use)		Registered Labels, LUIS report 2/6/2009, Usage Data 2006-2010[2]
Interval Between Applications	10 day		Registered Labels, LUIS report 2/6/2009
Location Specific Crop Scenarios and Application Date	GAPecansSTD, w93805 June 15		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles,[1] PRZM-EXAM Scenario Profiles and Meteorological Data.
Sorghum			
CAM	4	Ground spray, foliar application	EFED Guidance
Application Type and Depth of Incorporation (cm)	0	Aerial application Ground application	EFED Guidance
Spray Drift Fraction	0.01	Aerial application Ground application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.99	Aerial application Ground application	EFED Guidance
Number of Applications/ Application Rate[2]	3/0.56 kg ai/a 2/1.1 kg ai/a		Registered Labels

Input Parameter (Symbol; Unit)	Value Used		Reference
Interval Between Applications	ns		Registered Labels
Location Specific Crop Scenarios and Application Date	KSsorghumSTD, w13996 May 30		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles,[1] PRZM-EXAMS Scenario Profiles and Meteorological Data.
Strawberries			
CAM	2	Aerial spray, foliar application	EFED Guidance
Application Type and Depth of Incorporation	0	Aerial application	EFED Guidance
Spray Drift Fraction	0.039	Aerial application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.95	Aerial application	EFED Guidance
Number of Applications/Application Rate[2]	1/2.2 and 2/1.1 kg ai/ha		Registered Labels, LUIS report 2/6/2009
Interval Between Applications	10 day		Registered Labels, LUIS report 2/6/2009
Location Specific Crop Scenarios and Application Date	CAfruit_WirringSTD, w93193 Jan. 29		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles,[1] PRZM-EXAM Scenario Profiles and Meteorological Data.
Sugar Beets			
CAM	2 4	Ground spray, foliar application Granular incorporated application	EFED Guidance
Application Type and Depth of Incorporation	0	Ground application	EFED Guidance
Spray Drift Fraction	0.01 0	Ground application Granular incorporated application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.99 1	Ground application Granular incorporated application	EFED Guidance
Number of Applications/Application Rate[2]	3/1.1 kg ai/ha 3/0.94 kg ai/ha 1/1.7 1/0.6 kg ai/ha (average typical use rate)		Registered Labels, LUIS report 2/6/2009 Usage Data 2006-2010[2] First typical use application is a granular incorporation followed by a foliar ground application
Interval Between Applications	10 day		Registered Labels, LUIS report 2/6/2009

Input Parameter (Symbol; Unit)	Value Used		Reference
Location Specific Crop Scenarios and Application Date	MNsugarbeetSTD, w14914 May 28		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles,[1] PRZM-EXAM Scenario Profiles and Meteorological Data.
Sunflower, Wheat			
CAM	2	Ground spray, foliar application	EFED Guidance
Application Type and Depth of Incorporation	0	Ground application	EFED Guidance
Spray Drift Fraction	0.01	Ground application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.99	Ground application	EFED Guidance
Number of Applications/Application Rate[2]	2/1.7 kg ai/ha (sunflower) and 2/0.56 (wheat) kg ai/ha		Registered Labels, LUIS report 2/6/2009 Sunflowers and wheat are grown as rotational crops in some locations. One season of each crop was assumed for modeling since a yearly application limit was not provided on the label.
Interval Between Applications	7 day and 158 days		Registered Labels, LUIS report 2/6/2009
Location Specific Crop Scenarios and Application Date	GAPecansSTD, w93805 June 15		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles,[1] PRZM-EXAM Scenario Profiles and Meteorological Data.
Sweet Potato			
CAM	1	Aerial spray, soil application	EFED Guidance
Application Type and Depth of Incorporation	0	Aerial application	EFED Guidance
Spray Drift Fraction	0.039	Aerial application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.95	Aerial application	EFED Guidance
Number of Applications/Application Rate[2]	1/2.2 kg ai/ha		Registered Labels, LUIS report 2/6/2009
Interval Between Applications	10 day		Registered Labels, LUIS report 2/6/2009
Location Specific Crop Scenarios and Application Date	NCSweetPotatoSTD, w13722 May 15		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles(growing season Apr. 1-Oct. 10), [1] PRZM-EXAM Scenario Profiles and Meteorological Data.
Tobacco			
CAM	4	Ground spray, incorporated application	EFED Guidance
Application Type and Depth of Incorporation	5.1 cm	Ground application	EFED Guidance

Input Parameter (Symbol; Unit)	Value Used		Reference
Spray Drift Fraction	0.01	Ground application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.99	Ground application	EFED Guidance
Number of Applications/ Application Rate[2]	1/2.2 kg ai/a		Registered Labels, LUIS report 2/6/2009
Interval Between Applications	na		Registered Labels (no minimum retreatment interval is provide on the label)
Location Specific Crop Scenarios and Application Date	NCtobaccoSTD, w13722 April 15		Registered Labels, LUIS report 2/6/2009, Crop Specific Profiles,[1] PRZM-EXAM Scenario Profiles and Meteorological Data.
Turfgrass			
CAM	2	Ground spray, foliar application	EFED Guidance
Application Type and Depth of Incorporation	0	Ground application	EFED Guidance
Spray Drift Fraction	0.01	Ground application	AgDRIFT modeling based on registered label restrictions
Application Efficiency	0.99	Ground application	EFED Guidance
Number of Applications/ Application Rate[2]	26/4.4 kg ai/a 26/2.2 kg ai/a 6/2.2,		Registered Labels, PRZM-EXAMS can only accommodate 26 applications; labels suggest multiple application May-August depending on target pest
Interval Between Applications	3 day 3 day 30, 7, 7, 60, and 30 days		Registered Labels (no minimum retreatment interval is provide on the label)
Location Specific Crop Scenarios and Application Date	PAturfSTD, w14751 May 9		Registered Labels (suggested applications are mid May-July), LUIS report 2/6/2009, Crop Specific Profiles,[1] PRZM-EXAMS Scenario Profiles and Meteorological Data.

1. National Information System for the Regional IPM Centers, http://www.ipmcenters.org/cropprofiles/
2. Information provided by BEAD June 8, 2011

Modeling Data

The EDWCs reported in this section are based on Tier I groundwater and Tier II surface water modeling for currently registered uses of chlorpyrifos. EDWCs are provided for chlorpyrifos and chlorpyrifos-oxon. As detailed in **Table 11**, EDWCs for chlorpyrifos and chlorpyrifos-oxon generated from surface water sources provide the most conservative estimations of the potential exposure to either of these chemicals in drinking water. Characterization of the reported EDWCs for the various chlorpyrifos use patterns evaluated in this assessment, including assumptions and uncertainties taken into consideration for each modeled scenario, are provided in **Tables 10** and **11**. Further analysis of the EDWCs by source follows **Table 11**.

Table 11. EDWCs Resulting from Chlorpyrifos Use

Represented Crop Use	Chlorpyrifos			Chlorpyrifos-Oxon[1]		
Drinking Water Source	**Peak EDWC µg/L (ppb)**	**Yearly Mean µg/L (ppb)**	**Average of Yearly Means µg/L (ppb)**	**Peak EDWC µg/L (ppb)**	**Yearly Mean µg/L (ppb)**	**Average of Yearly Means µg/L (ppb)**
Alfalfa						
Surface Water	46.54	3.85	2.29	44.41	3.68	2.18
Groundwater	0.04			0.04		
Comments: The Texas alfalfa scenario was used for modeling alfalfa. This PRZM scenario provides EDWCs for an area of the US known to have high organophosphate usage. The Texas alfalfa scenario was developed as part of the OP cumulative assessment. Current chlorpyrifos labels provide a maximum single application, the maximum number of applications per year, per season, or per cutting and a minimum retreatment interval for alfalfa. In some locations it is possible to have up to 9 cuttings (this may be the result of multiple seasons per year). For such scenarios the reported EDWCs are not expected to be conservative.						
Almond						
Surface Water	18.16	3.29	2.52	17.32	3.14	2.41
Groundwater	0.09			0.09		
Comments: Chlorpyrifos labels permit multiple types of applications on almonds such as dormant/delayed dormant applications, foliar, trunk drenches, as well as orchard floor applications. Labels do not restrict the amount of chlorpyrifos that can be applied to an individual almond orchard in a year; therefore, all application types were assumed to occur within one year for assessment purposes. The application rate for trunk spray/preplant dip is a dilution factor, 3 lbs ai/100 gallons, of water and was not modeled. This was done as it is unclear if orchard floors and trunk spray can occur within the same year. The reported EDWCs do not reflect the inclusion of the trunk spray. Therefore, if a trunk spray can be applied in addition to the other types of applications the reported EDWCs may underestimate the risk of chlorpyrifos applications to almonds. *EFED recommends that all application rates be reported in lbs ai/a or information that can be used to derive such a rate be provided on the label. The labels should also clearly state the maximum single and yearly application rates for chlorpyrifos on almonds.*						
Apple						
Surface Water	40.88	4.53	2.72	39.00	4.32	2.59
Surface Water (typical)	40.19	4.19	2.62	38.34	3.99	2.50
Groundwater	0.02			0.02		
Comments: The trunk drench application rate is only provided as a dilution factor (1.5 lbs ai/100 gallons of water). The application rate was assumed to be 1.5 lbs ai/a; however, it is possible that the application rate is significantly higher. If the application rate is higher the EDWCs reported here likely underestimate the actual exposure. Typical use rate data from the last five years indicate that, in general, multiple applications of chlorpyrifos are made to apples in a given year. For the purposes of characterizing the typical use rates, two applications were modeled and the EDWCs are reported above. Since there is no application interval specified on the label, a 30 day application interval was assumed based on the maximum application interval specified on the labels (citrus).						
Asparagus						
Surface Water	10.93	1.27	0.70	10.43	1.21	0.67
Surface Water[4]	10.11	0.68	0.25	9.64	0.65	0.24
Groundwater	0.03			0.03		
Comments: Chlorpyrifos labels permit both liquid and granular applications of chlorpyrifos on asparagus. Granular applications reduce pesticide transport via spray drift; however, it is unclear how the granular formulation impacts the dissipation of chlorpyrifos in the environment. The granular formulation could reduce the dissipation rate of chlorpyrifos. Maximum single application rates are higher for granular formulations than liquid formulations; however, liquid formulations permit more applications. Some liquid formulations do not specify yearly maximum application rates. For modeling purposes, 3lbs ai/a was assumed to be the yearly maximum application rate for both formulation types. This corresponds to 1 pre-harvest or 2 post-harvest applications per season for liquid formulations. The results suggest that applications of granular chlorpyrifos do not significantly reduce the EDWCs compared to liquid formulations. *All labels should also clearly state the maximum yearly application rates for chlorpyrifos on asparagus.*						

Represented Crop Use	Chlorpyrifos			Chlorpyrifos-Oxon[1]		
Drinking Water Source	**Peak EDWC µg/L (ppb)**	**Yearly Mean µg/L (ppb)**	**Average of Yearly Means µg/L (ppb)**	**Peak EDWC µg/L (ppb)**	**Yearly Mean µg/L (ppb)**	**Average of Yearly Means µg/L (ppb)**
Cherries						
Surface Water	113.80	18.18	11.06	108.58	17.35	10.55
Surface Water (typical)	23.02	4.04	2.26	21.96	3.85	2.15
Groundwater	0.12			0.12		
Comments: Recently approved labels better define chlorpyrifos uses on cherries; however, the application rates are provided as dilution factors and do not restrict the lbs ai/a that can be applied to cherries. *EFED recommends that all application rates be reported in lbs ai/a or information that can be used to derive such a rate. The labels should also clearly state the maximum single and yearly application rates for chlorpyrifos on cherries.*						
Christmas Trees						
Surface Water	32.10	3.16	1.92	30.63	3.01	1.83
Groundwater	0.09			0.09		
Comments: The application rate for stump treatment is provided as a dilution factor (3 lbs ai/gal of water). This type of application was not assessed and is not represented by the reported EDWCs. *EFED recommends that labels be reviewed to clearly state the maximum single and yearly application rates for chlorpyrifos use on Christmas trees.*						
Citrus						
Surface Water	90.74	11.70	7.72	86.57	11.16	7.37
Surface Water (typical)	44.48	6.31	4.36	42.44	6.02	4.16
Groundwater	0.11			0.10		
Comments: Chlorpyrifos labels permit multiple types of applications on citrus, including orchard floor and foliar applications. Application rates for both types of applications specifically exclude the other type of application; therefore, it was assumed that both types of applications will occur in an individual citrus orchard within a year. Since the higher foliar application rates are only allowed in California it was not used in modeling of Florida citrus, which is expected to be protective of other citrus scenarios. Typical use rates for lemons and oranges were modeled; oranges provided the most conservative EDWCs.						
Cole Crops						
Surface Water	66.42	9.43	6.59	63.37	9.00	6.28
Groundwater	0.06			0.06		
Comments: Current chlorpyrifos labels provide application rate restrictions per season and not per year. Since there are many location in the US that can accommodate three cole crops per year, three growing seasons were modeled and are reflected in the reported EDWCs. *EFED recommends that labels be updated to clearly state the maximum yearly application rates for chlorpyrifos use on cole crops.*						
Corn, Soybean						
Surface Water	30.90	4.61	3.12	29.49	4.39	2.98
Surface Water (typical)	4.39	0.82	0.50	4.19	0.78	0.48
Groundwater	0.03			0.03		
Comments: Current chlorpyrifos labels permit both liquid and granular applications of chlorpyrifos on corn. Granular applications reduce pesticide transport via spray drift; however, it is unclear how the granular formulation impacts the dissipation of chlorpyrifos in the environment. The granular formulation could reduce the dissipation rate of chlorpyrifos. Typical use rates are for corn and the resulting EDWCs may not represent soybean.						
Cotton						
Surface Water	43.69	6.76	5.24	41.68	6.45	5.00
Groundwater	0.03			0.03		
Comments: n/a						
Grape						
Surface Water[2]	494.00	73.19	52.14	471.33	69.83	49.74
Surface Water[2, 4]	623.70	82.05	54.72	595.07	78.29	52.20
Surface Water	112.20	14.74	9.83	107.05	14.06	9.38
Surface Water (typical	2.89	0.43	0.26	2.76	0.41	0.25

Represented Crop Use	Chlorpyrifos			Chlorpyrifos-Oxon[1]		
Drinking Water Source	**Peak EDWC µg/L (ppb)**	**Yearly Mean µg/L (ppb)**	**Average of Yearly Means µg/L (ppb)**	**Peak EDWC µg/L (ppb)**	**Yearly Mean µg/L (ppb)**	**Average of Yearly Means µg/L (ppb)**
two application)						
Groundwater	0.34			0.32		
Comments: Chlorpyrifos labels permit soil surface applications at a maximum single rate of 7.5 x 10^{-4}lb/ft^2 to 7.7 x 10^{-4}lb/ft^2 (32.7 to 33.5 lbs ai/a). Some labels provide a yearly application rate restriction of 6 lbs/a (062719-00301) while other labels do not. Some labels specify restriction of 1 lbs ai/a for pre-bloom applications, but not for other application types such as a post-bloom application. The high application rate is permitted on the 11-15ft^2 (3.75-4.4 ft circle) at the base of the vine (trunk). The maximum number of grape vines that can be grown per acre is unknown; therefore, because of the proximity of grape vines (trunks) in a vineyard it may be possible that an entire acre can be treated at this high application rate. If there is insect pressure within a vineyard, the entire vineyard may be treated because of the susceptibility associated with proximity. Two different application dates were modeled for the highest application rate and the resulting EDWCs are reported above. The results indicate that application timing can significantly impact the EDWCs for this use pattern. *The labels should clearly state the maximum single and yearly application rates for chlorpyrifos on grape in lbs ai/a. Because of the high application rate, additional information on application timing will significantly reduce the uncertainty associated with this use.* Typical use rate data indicate that, in general, multiple applications of chlorpyrifos are made to grapes in a given year. For the purposes of characterizing the typical use rates over the last five years, two applications were modeled and the EDWCs are reported above. Since there is no application interval specified on the label, a 150 day application interval was assumed based on expected pest pressure.						
Legume Vegetables (except soybean)						
Surface Water	8.06	1.29	0.73	7.69	1.23	0.70
Groundwater	0.01			0.01		
Comments: Although chlorpyrifos applications are not permitted in Mississippi for legume vegetables, the standard scenario for Mississippi soybean was used as a surrogate for legume vegetables. In some locations such as California, legume vegetables such as snap beans can have two crops per year (spring and fall). Only one crop per year was modeled. If more than one crop is planted per year the reported EDWCs may not be conservative.						
Mint						
Surface Water	17.61	2.94	2.21	16.80	2.81	2.11
Groundwater	0.06			0.06		
Comments: Chlorpyrifos labels permit multiple types of applications on mint, including pre-plant and foliar applications. There is no minimum retreatment interval provided on the label. Based on the use pattern--one preplant application, one growing season application and one post harvest application—and the fact that there is a 90 day pre-harvest application restriction, a 90 day interval was chosen for modeling. If applications occur more frequently than 90 days the reported EDWCs may not be conservative.						
Onion Bulbs						
Surface Water	8.31	1.50	0.95	7.93	1.43	0.91
Groundwater	0.02			0.02		
Comments: The reported EDWCs are reflective of two non-incorporated soil applications. The label suggests that the at-plant soil drench should be incorporated to at least 1 inch. Incorporation will reduce the surface water EDWCs; however, a significant impact is not expected. Since chlorpyrifos applications to onion bulbs do not result in the highest EDWCs, it should not impact the conclusions of this assessment. Additional modeling can be completed that considers incorporation if needed.						
Peaches						
Surface Water	35.20	2.39	1.45	33.58	2.28	1.38
Groundwater	0.03			0.03		
Comments: Labels permit multiple types of applications; however, recently approved labels only permit one application of any product containing chlorpyrifos per year. If these revisions are not intended for all labels, the EDWCs reported above may not be protective for chlorpyrifos use on peaches. For modeling purposes the highest application was used and assumed to be the trunk drench. Since the trunk drench is provided as a dilution factor (3 lbs ai/gal of water), it was assumed that all 100 gals would be applied to one acre; therefore, the application rate is equivalent to 3 lbs ai/a. If more than 100 gallons of the (3 lbs ai/gal of water) is applied to an acre, the reported						

Represented Crop Use	Chlorpyrifos			Chlorpyrifos-Oxon[1]		
Drinking Water Source	**Peak EDWC µg/L (ppb)**	**Yearly Mean µg/L (ppb)**	**Average of Yearly Means µg/L (ppb)**	**Peak EDWC µg/L (ppb)**	**Yearly Mean µg/L (ppb)**	**Average of Yearly Means µg/L (ppb)**
EDWCs may not be protective. *EFED recommends that labels be updated to clearly state the maximum single and yearly application rates for use on peaches, as well as other tree fruits.*						
Peanut						
Surface Water	59.85	6.17	3.40	57.10	5.89	3.25
Surface Water[5]	7.77	0.81	0.49	7.42	0.47	0.54
Groundwater	0.04			0.04		
Comments: The language on some of the labels is conflicting. For example, 062719-00220 permits pre-plant broadcast applications in the general remarks suggestions; however, under the specific use restriction section the label suggests both preplant and post plant applications are permitted for no more than 4 lbs ai/a per season. A recently approved label (66222-19) only permits one soil applied preplant broadcast spray (2 lbs ai/a per season). Both scenarios were modeled and the EDWCs are reported above. The reported EDWCs for two applications are reflective of two non-incorporated aerial soil applications. A 10 day application interval was used for modeling; however, no application interval is specified on the labels. If applications are made with less than a 10 day application interval, the reported EDWCs may not be protective. The label suggests that the preplant application be incorporated to at least 3 inches. Incorporation will reduce the surface water EDWCs. Since chlorpyrifos applications to peanuts do not result in the highest EDWCs, it doesn't impact the conclusions of this assessment. Additional modeling for the two application scenario that considers incorporation can be completed, if needed.						
Pecans						
Surface Water	115.50	15.71	8.82	110.20	14.99	8.41
Surface Water (typical)	29.55	4.07	2.33	28.19	3.88	2.23
Groundwater	0.10			0.10		
Comments: Chlorpyrifos labels permit multiple types of applications on pecans including orchard floor and foliar applications. Application rate restrictions are provided for both types of applications, but do not limit the amount of chlorpyrifos that can be applied by another type of application. Therefore, it was assumed that both types of applications will occur in an individual pecan orchard within a year.						
Sorghum						
Surface Water	25.83	2.63	1.74	24.64	2.51	1.66
Groundwater	0.03			0.03		
Comments: n/a						
Strawberries						
Surface Water	34.79	5.34	3.73	33.19	5.09	3.56
Groundwater	0.04			0.04		
Comments: n/a						
Sugar Beets						
Surface Water	10.55	1.12	0.69	10.06	1.07	0.65
Surface Water (typical)	15.05	4.51	1.94	14.36	4.30	1.85
Groundwater	0.03			0.03		
Comments: n/a						
Sunflower, Wheat						
Surface Water	76.63	6.79	4.40	73.12	6.48	4.20
Groundwater	0.04			0.04		
Comments: Sunflowers and wheat are grown as rotational crops in some locations. One season of each crop was assumed for modeling since a yearly application limit for chlorpyrifos was not provided on the label. Current labels do not specify an application interval for wheat. *EFED recommends that labels be updated to clearly state application intervals for wheat.*						
Sweet Potatoes						
Surface Water	40.93	5.42	4.04	39.05	5.17	3.86
Groundwater	0.02			0.02		
Comments: n/a						

Represented Crop Use	Chlorpyrifos			Chlorpyrifos-Oxon[1]		
Drinking Water Source	**Peak EDWC µg/L (ppb)**	**Yearly Mean µg/L (ppb)**	**Average of Yearly Means µg/L (ppb)**	**Peak EDWC µg/L (ppb)**	**Yearly Mean µg/L (ppb)**	**Average of Yearly Means µg/L (ppb)**
Tobacco						
Surface Water	8.77	0.73	0.50	0.69	0.48	0.61
Groundwater	0.02			0.02		
Comments: Recently approved labels have maximum single application rates of 1 lb ai/a; however, the label data report indicates single application rates are up to 2 lbs ai/a. The higher application rate was modeled.						
Turfgrass (sod farms, turf, industrial plant, and road medians), Ornamentals						
Surface Water	446.90	40.67	21.17	426.39	38.80	20.20
Surface Water[6]	223.40	5.65	2.70	213.15	19.41	10.10
Surface Water[6]	45.39	5.65	2.70	43.30	5.39	2.58
Groundwater	1.1			1.0		
Comments: The EDWCs for turf are the result of current labels not having specified a maximum seasonal application rate restriction or a minimum retreatment interval. For modeling, 26 applications were assumed with a three day application interval. Some ornamental labels suggest a second application after three days; therefore, the assumption of the three day retreatment intervals was viewed as not being an overly conservative assumption. A three day application interval is also supported by the worker re-entry restriction (1 day), as well as the time it take to scout (1 day) for pests and arrange for treatment (1 day). PRZM is only able to accommodate 26 applications. If more applications occur, the reported EDWCs may underestimate the potential exposure to chlorpyrifos and chlorpyrifos-oxon. Turf labels suggest multiple applications May-August; therefore, it is likely there are a number of applications occurring on turf. If applications occur more frequently the EDWCs reported here may underestimate the risk from chlorpyrifos applications to turf. Current labels for ornamentals permit applications up to 4 lbs on an as needed basis. If multiple 4 lb applications occur, the reported EDWCs may underestimate the potential exposure to chlorpyrifos and chlorpyrifos oxon. A result for turf applications at 2 lbs is also reported. As a low end turf scenario, a second modeling scenario was developed which took into account only those applications that are specified on current labels (uses that include suggested application timeframes). This scenario, however, doesn't take into account applications to turf for pests that the label does not include details on the specific application timing.						
Wood Products						
Surface Water	nd	nd	nd	nd	nd	nd
Groundwater	nd			nd		
Comments: The label doesn't provide an application retreatment interval and it is unclear if the application rate provided on the label is per square foot of wood or land. There is no annual application restrictions provided on the label. In addition, there is no usage data available. It is also unclear if applications occur in centralized locations such as a lumber yard, or if applications are localized such as individual utility poles. Because of all these uncertainties, this use scenario was not modeled. This use scenario is not expected to result in higher EDWCs than those reported here for other use scenarios, as the application rate (lb ai/a) is expected to be lower for the treatment of individual fence posts, utility poles, etc. However, if wood treatment is occurring at a lumber mill or lumber yard on a large quantity of wood products or on a fairly frequent basis, the EDWCs could be high. This is an uncertainty of this assessment.						

1. Chlorpyrifos-oxon EDWCs were derived from chlorpyrifos EDWCs. This was done by multiplying chlorpyrifos EDWCs by 0.9541 (molecular weight correction factor) and 100% (a conservative estimate of the maximum possible conversion in the environment and/or during water purification).
2. Reported EDWCs for surface water are the result of a high application rate trunk drench.
3. Reported EDWCs is for granular application.
4. Alternative application date.
5. Single soil incorporated application
6. Alternative turf scenarios
   Groundwater modeling provides a single output value that represents the concentrations that might be expected in shallow unconfined aquifers under sandy soils. Output is recommended for both acute and chronic endpoints.
   nd= not determined

Surface Water

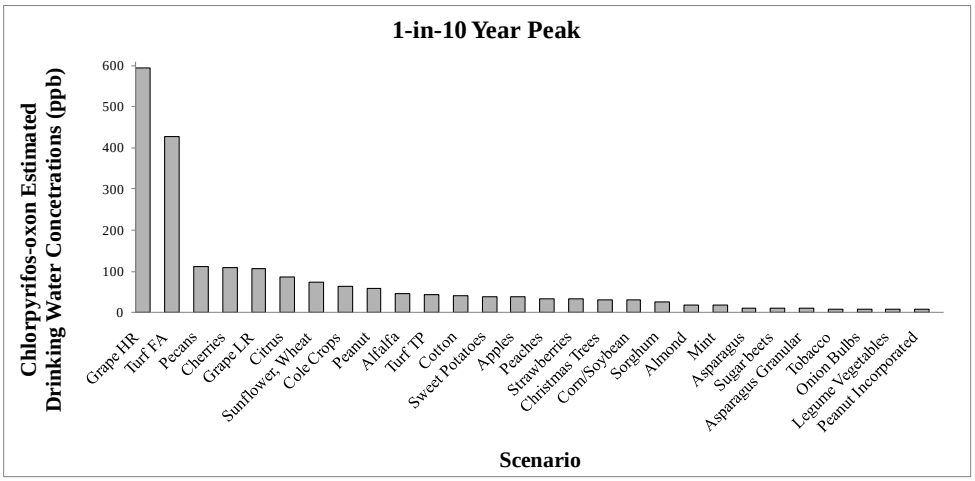
Tier II chlorpyrifos-oxon EDWCs for all modeled scenarios are provided in **Table 11**. **Figure 7** provides a visual representation of the Tier II surface water EDWCs for chlorpyrifos-oxon. EDWCs for chlorpyrifos and chlorpyrifos-oxon range over a few orders of magnitude. These EDWCs are derived from chlorpyrifos uses on a national basis. In general, the EDWCs reported in this assessment are higher than previously reported in the RED and remodeled in a 2007 DWA (DP 336295). A summary of the most conservative EDWCs reported in the RED and the 2007 remodeled EDWCs are presented in **Table 12**.

Grape, corn/soybean and sugar beet were singled out as representative crops because there is a large amount (>100,000 lb) of chlorpyrifos applied to these crops per year, a large portion (percent treated/percent crop planted) of these crops are treated with chlorpyrifos and/or the use locations are distributed throughout the United States. In addition, the reported EDWCs for grape, corn/soybean and sugar beets are generally representative of EDWCs for other chlorpyrifos use scenarios. The chlorpyrifos use profiles for grape, corn/soybean and sugar beets are compared to other chlorpyrifos use scenarios in **Tables 13-15**. These tables highlight the amount of chlorpyrifos used on each crop, the percentage of the crop treated with chlorpyrifos and if the crops are grown in areas where surface water intakes serve community drinking water supplies. While the analysis provided in **Tables 13-15** do not specifically take into account the co-occurrence of multiple chlorpyrifos uses (multiple crops) in the one watershed, the use of a PCA value of 1 (considers 100% of the watershed is treated) in the reported EDWCs accounts for multiple uses, including turf, within a watershed.

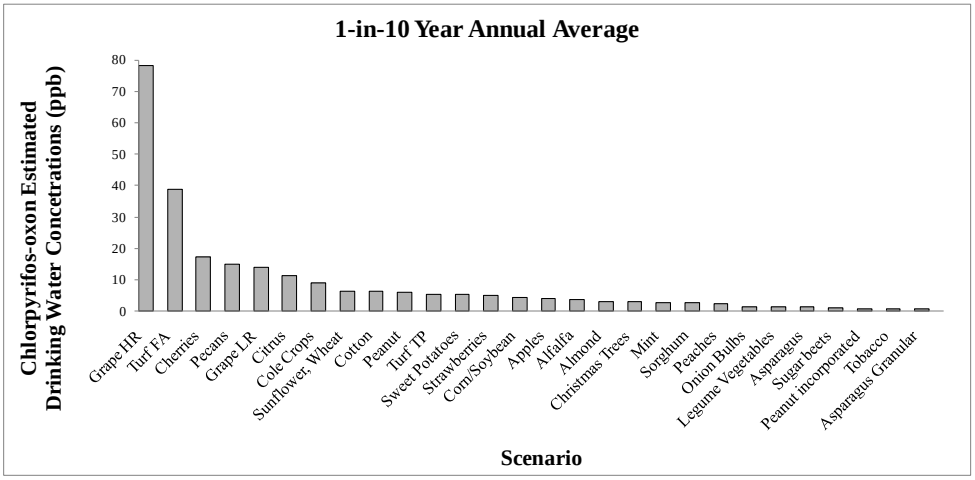
There are two modeled chlorpyrifos use scenarios that result in EDWCs that are significantly higher than the majority of the modeled chlorpyrifos use scenarios. These use scenarios are for grape and turf, as shown in **Figure 7**. The EDWCs reported for Grape HR (high rate) are the result of a high application rate trunk drench, which is currently permitted on a few labels and may not represent actual or intended use of chlorpyrifos on grape. Some recently approved labels restrict the use of chlorpyrifos on grape to 6 lbs a.i./a; however, active labels remain that permit the higher application rate. Addition of a per year application restriction of 6 lb a.i./a reduces the EDWCs 6-fold. Typical use rates for grape are approximately 2.5 lb a.i./a. The typical use rate was also modeled and the results compared to the results for the other grape scenarios. EDWCs for all grape scenarios are presented in **Figure 8**. The EDWCs for the typical use rate results in EDWCs that are approximately one third the EDWCs calculated for the 6 lb a.i/a scenario. All EDWCs are reported in **Table 11**.

The EDWCs reported for turf FA (frequent applications) is based on 26 applications (limit of PRZM-EXAMS) and a 3 day application interval. This scenario was developed to highlight the uncertainty associated with the unrestricted (labels do not currently restrict the number of chlorpyrifos applications per year) use of chlorpyrifos on turf and may not represent actual or intended use of chlorpyrifos on turf. However, if more than 26 applications are made per year, or if the application interval is less than 3 days, the EDWCs reported in this DWA may underestimate the exposures resulting from chlorpyrifos use on turf. For some of the target pests included on the turf label there are a number of suggested application dates/timeframes and retreatment cycles; however, there are many pests for which this information is not provided.

a)



b)



c)

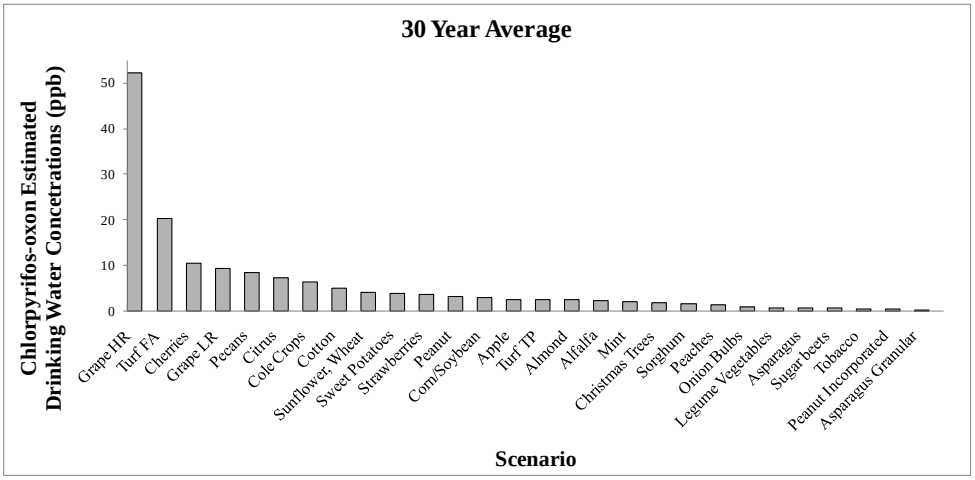


Figure 7. Estimated Drinking Water Concentrations of Chlorpyrifos-oxon Resulting From the Registered Uses of Chlorpyrifos a) 1-in-10 year peak, b) 1-in-10 Year Annual Mean and 3) 30 Year Average; HR (High Rate), LR (Low Rate), FA (frequent application), TP (target pest)

Table 12. Comparison of Reported EDWCs for chlorpyrifos and chlorpyrifos-oxon resulting from chlorpyrifos use; chlorpyrifos EDWCs from the RED were used to generate chlorpyrifos-oxon EDWCs. Chlorpyrifos-oxon EDWCs were not provided in the RED.

Crop Scenario	Chlorpyrifos (ppb)			Chlorpyrifos-oxon (ppb)		
	1-in-10 Year Peak	1-in-10 Year Annual Average	30 Year Average	1-in-10 Year Peak	1-in-10 Year Annual Average	30 Year Average
Preliminary 2011 Drinking Water Assessment						
Grapes LR	112.20	14.74	9.83	107.05	14.06	9.38
Corn/Soybean	30.90	4.61	3.12	29.49	4.39	2.98
Sugar beets	10.55	1.12	0.69	10.06	1.07	0.65
Tobacco	8.37	0.69	0.48	7.99	0.66	0.45
RED Drinking Water Assessment						
Tobacco[1]	77.91	18.96	14.26	74.33	18.09	13.61
2007 Reevaluation of RED Modeling (updated tobacco label)						
Tobacco	36.73	6.89	4.72	35.04	6.57	4.50

1. RED values were previously reported for the farm pond (30.6 µg/L 1-in-10 Year Peak). The reported values have been adjusted for the index reservoir.

Table 13. Representation of Estimated Drinking Water Concentrations of Chlorpyrifos and Chlorpyrifos-oxon Resulting From Chlorpyrifos Use on Grape (bold font)

Crop	Pounds of Chlorpyrifos Applied to Crop per Year	Maximum Percent of Crop Treated with Chlorpyrifos	Chlorpyrifos Use (lb a.i./sq mi) Known to Grow Substantial Amounts of the Represented Crop	Crop Grown in Areas Known to Have Community Water Shed Surface Water Intakes
Cherries	70,000	45	61	yes
Grape	**100,000**	**15**	**30**	**yes**
Lemons	90,000	60	61	yes
Oranges	400,000	35	61	yes
Pecan	300,000	40	30	yes

Table 14. Representation of Estimated Drinking Water Concentrations of Chlorpyrifos and Chlorpyrifos-oxon Resulting From Chlorpyrifos Use on Corn/Soybean (bold font)

Crop	Pounds of Chlorpyrifos Applied to Crop per Year	Maximum Percent of Crop Treated with Chlorpyrifos	Chlorpyrifos Use (lb a.i./sq mi) Known to Grow Substantial Amounts of the Represented Crop	Crop Grown in Areas Known to Have Community Water Shed Surface Water Intakes
Apple	400,000	65	30	yes
Corn	**2,900,000**	**5**	**61**	**yes**
Sorghum	20,000	<2.5	2	yes
Soybean	1,100,000	10	61	yes
Strawberries	10,000	30	61	yes

Table 15. Representation of Estimated Drinking Water Concentrations of Chlorpyrifos and Chlorpyrifos-oxon Resulting From Chlorpyrifos Use on Sugar Beet (bold font)

Crop	Pounds of Chlorpyrifos Applied to Crop per Year	Maximum Percent of Crop Treated with Chlorpyrifos	Chlorpyrifos Use (lb a.i./sq mi) Known to Grow Substantial Amounts of the Represented Crop	Crop Grown in Areas Known to Have Community Water Shed Surface Water Intakes
Asparagus	20,000	45	61	yes
Green Beans	3,000	5	61	yes
Mint	50,000	25	61	yes
Onion	60,000	50	61	yes
Sugar Beet	**200,000**	**20**	**2**	**yes**
Tobacco	100,000	15	12	yes

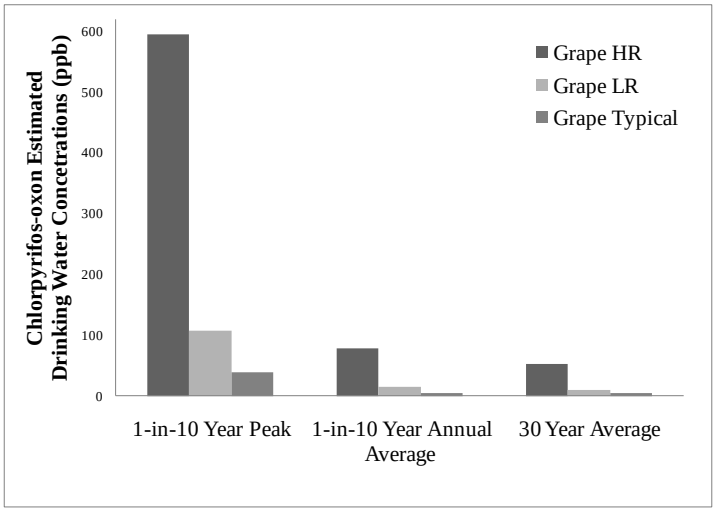


Figure 8. Estimated Drinking Water Concentrations of Chlorpyrifos-oxon Resulting From Chlorpyrifos Use on Grape

Typical chlorpyrifos usage information for turf would help EFED further refine its final drinking water assessment. If only those applications that are prescribed on the label are considered for modeling purposes, the EDWCs are significantly lower than the Turf FA scenario as shown in **Figure 9** for Turf TP (target pest). Addition of an application interval and a maximum yearly application rate on the turf labels will reduce exposure to chlorpyrifos-oxon in drinking water and reduce the uncertainties associated with this assessment.

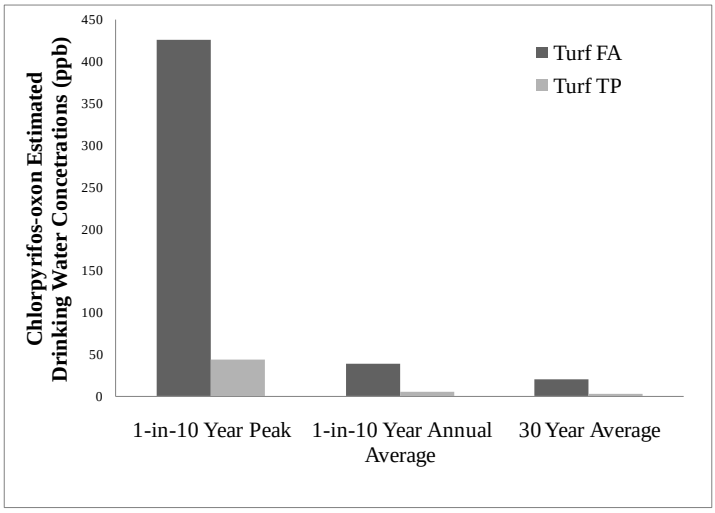


Figure 9. Estimated Drinking Water Concentrations of Chlorpyrifos-oxon Resulting From Chlorpyrifos Use on Turf

Typical application rates (single application rate, application number per year, and agronomic practices) were obtained from BEAD and modeled.[7] A comparison of typical use rates and the maximum label rates are shown in **Table 16**. EDWCs resulting from maximum application rate scenarios (standard) are compared to typical application rate scenarios (typical) in **Table 11** as well as **Table 16**. In general, typical single application rates and the typical number of applications per year can vary from those provided on the label. The EDWCs for typical use scenarios are based on the average typical application rate and not the typical upper bound rate as recommended by BEAD.[7] In most cases, typical use rate scenarios result in lower EDWCs than the maximum use rate scenarios. For corn and sugar beets the typical average use rates are similar to the maximum rates but the number of applications applied each year is less than the label maximum.

Table 16. Comparison of Average Typical Chlorpyrifos Use Rates to Standard Modeling Rates; Average typical use rate data are based on five years of data as provided by BEAD and is reported as an average value.[7]

Crop	Scenario	Single Application Rate (lb a.i./a)	Number of Applications per Year	Chlorpyrifos-oxon		
				1-in-10 Year Peak (µg/L)	1-in-10 Year Annual Average (µg/L)	30 Year Average (µg/L)
Apples	Label Rate	2.0	2.0	39.0	4.32	1.24
	Typical Rate	1.5	1.2	38.34	3.99	2.50
Cherries	Label Rate	1.5	8	108.58	17.35	10.55
	Typical Rate	1.5	1.1	21.96	3.85	2.15
Citrus (lemons)	Label Rate	2/3.5 and 3/1	5	86.57	11.16	7.37
	Typical Rate	3.5	1	28.04	4.02	2.76
Citrus (oranges)	Label Rate	2/3.5 and 3/1	5	86.57	11.16	7.37
	Typical Rate	2.5	1.4	42.44	6.02	4.16
Corn	Label Rate	1.0	3	29.49	4.39	2.98
	Typical Rate	0.9	1	**4.19**	**0.78**	**0.48**
Grape	Label Rate	1/33.3 or 1/6.0	1	107.05	14.06	9.38
	Typical Rate[1]	2.2	1.2	**2.76**	**0.41**	**0.25**
Pecan	Label Rate	1/ 4.0 and 3/2.0	4	110.20	14.99	8.41
	Typical Rate	0.9	2.2	28.19	1.34	2.23
Sugar Beets	Label Rate	1.0	3	10.06	1.07	0.65
	Typical Rate	0.8	1.2	**14.36**	**4.30**	**1.85**

For modeling purposes if the average application number is not equal to an integer the next highest integer was assumed.

1. Value is provided for all grapes (i.e., raisin, table and wine). Typical single application rate for table grapes is 2.7 lb a.i./a.

For grape, the typical single use rate is less than the maximum use rate provided on the labels; however, the number of typical applications is greater. This is attributed to a California special local need (Sec. 24c) label. A few other typical chlorpyrifos use rates are provided in **Table 16** as supplemental information. In order to do a thorough comparison of the label maximum application rates and typical use rates, further analysis of the typical use rates, including the average upper bound application rates, is required.

In addition to exploring the impact that various application rate scenarios have on the EDWCs for chlorpyrifos or chlorpyrifos-oxon, the effect of water chemistry on the degradation of chlorpyrifos was also examined. Laboratory studies indicate that chlorpyrifos is more susceptible to hydrolysis under alkaline conditions. **Figure 10** highlights the pH dependence of chlorpyrifos hydrolysis. If the pH in the environment is greater than 7 (pH assumed in PRXM-EXAMS modeling) the half-life used could overestimate the EDWCs. According to USGS water quality data, the pH of surface waters in the U.S. ranges from 4.9-9.2, with a median value of 8.0. A literature study concluded the half-life of chlorpyrifos at pH 8 and 9 to be 71 and 39 days, respectively.[3] The guideline study submitted to the Agency estimates the hydrolysis half-life to be 16 days at pH 9 (MRID 00155577). Additional modeling indicates only a small reduction (<10%) in the EDWCs when the hydrolysis half-life at pH is taken into consideration (39 or 16 days for the literature study and guideline study, respectively). Modeling was not completed for pH 8 (median value) as the reduction would be smaller.

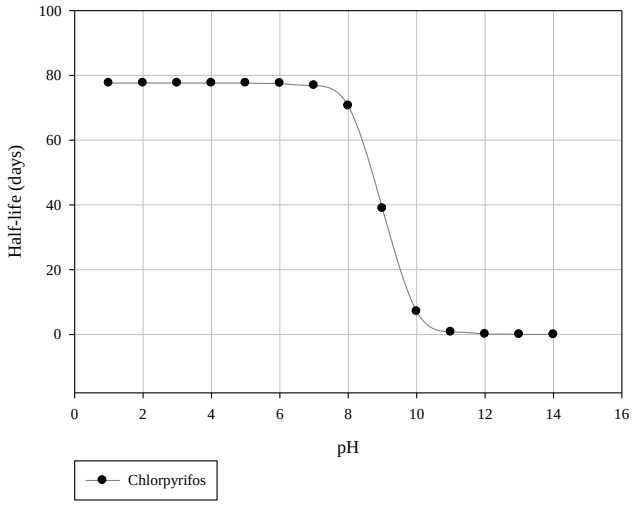


Figure 10. Hydrolysis of Chlorpyrifos as a Function of pH; Results are based on the hydrolysis rate constants reported in a drinking water purification simulation experiment and not on the submitted guideline study.

Time series data resulting from the PRZM-EXAMS model run for grape (6 lbs a.i./a trunk drench) are shown in **Figures 11** and **12**. The time series data show that peak detections are not frequent (sometimes >1 per year) and reinforces the notion that unless monitoring studies are designed to target chlorpyrifos, it is unlikely that peak concentrations will be observed. The time

series data for several chlorpyrifos use scenarios were evaluated that also indicate the potentially sporadic nature of the chlorpyrifos or chlorpyrifos-oxon peak concentrations in surface water.

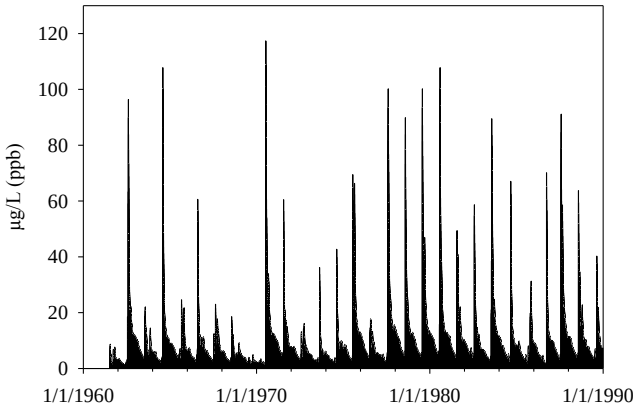


Figure 11. Times Series Data for Estimated Drinking Water Concentrations of Chlorpyrifos-oxon Over 30 Years

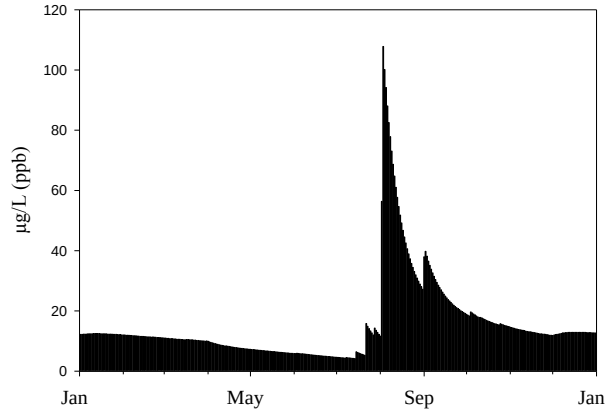


Figure 12. Times Series Data for Estimated Drinking Water Concentrations of Chlorpyrifos-oxon Over 1 Year (1980)

Monitoring Data

This assessment also takes into account non-targeted water monitoring data from the USGS National Water-Quality Assessment Program (NAWQA), USEPA/USGS Pilot Reservoir Monitoring Program, USDA Pesticide Data Program (PDP), California Department of Pesticide Regulation (CDPR), and National Center for Water Quality Research (NCWQR) at Heidelberg College. Analytical methods used in these monitoring programs are suitable for differentiating between chlorpyrifos and chlorpyrifos-oxon. The available monitoring data were evaluated for this preliminary assessment in reference to acute exposure. Further analysis is needed in order to determine if the data are representative of the potential chronic exposure resulting from currently registered uses of chlorpyrifos. The results of the monitoring data analysis are provided below by individual program and the data are provided in **Appendix C** unless otherwise noted.

USGS NAWQA

The NAWQA is a national-scale assessment program that contains monitoring data for pesticides in streams and ground water. The database includes an extensive amount of data and contains data for both chlorpyrifos and chlorpyrifos-oxon; however, the NAWQA monitoring program was not designed to specifically target chlorpyrifos use. Specifically, the sample timing and frequency were not designed to correspond with chlorpyrifos applications. The monitoring sites were not selected based on known chlorpyrifos treatment areas, although there are some sampling locations in high chlorpyrifos use areas. In general, sample frequencies are sporadic and range from once per year to a couple times per month depending on the site and year. For these reasons, the data included in the NAWQA dataset are expected to underestimate chlorpyrifos and chlorpyrifos-oxon concentrations. The magnitude of this underestimation is unknown. NAWQA monitoring data from 1991 to 2010 were evaluated for this assessment and the results are summarized below.

Groundwater

The peak detection of chlorpyrifos in groundwater is reported as <0.5 µg/L, while the maximum qualified detection of chlorpyrifos is 0.07 µg/L detected at a cropland location in Miller, Georgia (2002). Detection frequencies of chlorpyrifos in groundwater are 0.42% nationwide. The range of LODs for chlorpyrifos is 0.004 – 0.5 µg/L.

The peak chlorpyrifos-oxon concentration reported for groundwater is 0.06 µg/L. This detection was made in an agricultural area in Colbert, Alabama in 2009. Qualified detections of chlorpyrifos-oxon in groundwater are very low (<1%). The range of LODs for chlorpyrifos-oxon is 0.06-0.5 µg/L.

NAWQA data for chlorpyrifos and chlorpyrifos-oxon in groundwater are highlighted in **Table 17**.

Table 17. USGS NAWQA Groundwater Monitoring Data for Chlorpyrifos and Chlorpyrifos-oxon.

Parameter	Chlorpyrifos	Chlorpyrifos-oxon
Sampling Years	1992-2010	2005-2010
Number of Samples	11592	3519
Qualified Detections	44	3
Frequency of Detections	0.42%	<1%
Maximum Detection	0.0707 µg/L 2002 Miller, MS (cropland)	0.0553 µg/L 2009 Colbert, TN (agriculture)
HUC-8 Subbasins Reporting Detections	10 of 18	3 of 18

Surface Water

The highest detected concentration of chlorpyrifos in surface water is 0.57µg/L. This peak concentration was observed in 2003 at an urban location in Las Vegas, Nevada.

Chlorpyrifos detection frequencies in surface water are 14.76% nationwide. The range of LODs for chlorpyrifos is 0.004 – 0.5 µg/L.

Although the peak detection for chlorpyrifos-oxon in surface water reported as <0.34 µg/L for a mixed use area in Maryland in 2008, the maximum qualified (actual or estimated) detection of chlorpyrifos-oxon is 0.04 µg/L. This detection was made in 2008 at a Mississippi crop land location. Chlorpyrifos-oxon detection frequency is 0.33% nationwide. The range of LODs for chlorpyrifos-oxon is 0.013 - 0.33 µg/L.

NAWQA data for chlorpyrifos and chlorpyrifos-oxon in surface water are highlighted in **Table 18**.

Table 18. USGS NAWQA Surface Water Monitoring Data for Chlorpyrifos and Chlorpyrifos-oxon.

Parameter	Chlorpyrifos	Chlorpyrifos-oxon
Sampling Years	1991-2010	1999-2010
Number of Samples	28020	5693
Sample Frequency	varied	varied
Qualified Detections	4132	19
Frequency of Detections	14.75%	0.33%
Maximum Detection	0.57 µg/L 2003 Las Vegas, NV (urban)	0.0543 µg/L 2008 Washington, MS (cropland)
LOD	0.004 – 0.5 µg/L	0.013 - 0.33 µg/L
HUC-8 Subbasins Reporting Detections	18 of 18	7 of 18

USGS-EPA Pilot Reservoir Monitoring Program

The USGS pilot reservoir monitoring program was designed to examine pesticide concentrations in twelve water-supply reservoirs and subsequent Community Water Systems (CWS). The reservoirs sampled ranged in size from 120 to 92,600 acre-foot normal capacity within watersheds ranging from about 3 to 785 square miles. The sites were located in California, Indiana, Louisiana, Missouri, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, and Texas. Samples were collected from the raw-water intake and the finished-water tap located at the entry point to the distribution system. The correlation between raw and finished water detections are not adequate as finished water sampling generally occurred before raw water sampling. Each site generally was sampled every quarter, with biweekly sample collection during a four-month period coinciding with intensive pesticide applications. The program took place during 1999 and 2000. While sample timing and frequency were designed to target pesticide usage, the program was not specifically designed to correspond with chlorpyrifos applications. The monitoring sites were also not selected based on known chlorpyrifos treatment areas, but rather areas where pesticides are generally applied and runoff is likely. For these reasons, the data included in the USGS-EPA Pilot program are expected to underestimate chlorpyrifos and chlorpyrifos-oxon concentrations in drinking water. The magnitude of this underestimation is unknown.

The highest concentration of chlorpyrifos detected is 0.0341 µg/L (6.5%). This was observed for intake water. There are 21 reported detections of chlorpyrifos, all of which were observed before treatment. The LOD for chlorpyrifos is 0.004 µg/L. The peak detection for chlorpyrifos-oxon is reported as <0.016 µg/L—the LOD for chlorpyrifos-oxon is 0.016 µg/L. This is higher than the detection limit for chlorpyrifos. All less than values are reported for intake water. No detections of chlorpyrifos or chlorpyrifos-oxon are reported in finished water. The findings are summarized in **Table 19**.

Table 19. USGS-EPA Pilot Reservoir Monitoring Program Data for Chlorpyrifos and Chlorpyrifos-oxon.

Parameter	Chlorpyrifos	Chlorpyrifos-oxon
Sampling Years	1999-2000	1999-2000
Number of Samples	323	--
Sample Frequency	bimonthly	bimonthly
Qualified Detections	21	0
Frequency of Detections	6.5%	0%
Maximum Detection	0.0341 µg/L	< LOD
LOD	0.004	0.016

USDA Pesticide Data Program

The USDA Pesticide Data Program (PDP) Water Monitoring Survey is designed to collect monitoring data on pesticide residues in drinking water. Samples from raw intake water (source water) as well as finished drinking water are analyzed as part of the PDP, typically on a bimonthly basis. PDP began testing for pesticide residues in drinking water in 2001 and continues today. Samples have been collected from 82 locations in 28 states and the District of Columbia to date; however, only a subset of these sampling locations is sampled each year. Currently five sites are being sampled. The program has tested for both chlorpyrifos and chlorpyrifos-oxon. While both chlorpyrifos and chlorpyrifos-oxon are monitored for as part of the PDP, the program was not designed to specifically target chlorpyrifos—the sample timing and frequency were not designed to correspond with chlorpyrifos applications. Although there are some sampling locations in chlorpyrifos use areas, the monitoring sites were not selected based on known chlorpyrifos use areas. For these reasons, the data included in the PDP program are expected to underestimate chlorpyrifos and chlorpyrifos-oxon concentrations. The magnitude of this underestimation is unknown. The range of LODs for chlorpyrifos and chlorpyrifos-oxon are 0.006 – 0.027 and 0.012 – 0.510 µg/L, respectively. PDP does not report any detections of chlorpyrifos or chlorpyrifos-oxon. Intake and finished drinking water were analyzed separately and the results are summarized in **Table 20**.

Table 20. USDA Pesticide Data Program Monitoring Data for Chlorpyrifos and Chlorpyrifos-oxon

Parameter	Chlorpyrifos		Chlorpyrifos-oxon	
Source	Raw Intake Water	Finished Drinking Water	Raw Intake Water	Finished Drinking Water
Sampling Years	2004-2009	2001-2009	2004-2007	2001-2007
Number of Samples	1178	2918	470	1492
Sample Frequency	bimonthly	bimonthly	bimonthly	bimonthly
Qualified Detections	0	0	0	0
Frequency of Detections	0	0	0	0
Maximum Detection	na	na	na	na
LOD	0.006 – 0.027 µg/L	0.006 – 0.027 µg/L	0.059 – 0.510 µg/L	0.012 – 0.510 µg/L

California Department of Pesticide Regulation

The California Department of Pesticide Regulation (CDPR) maintains a Surface Water Database of pesticide detections in surface waters (large and small water bodies) for the entire state. In general, sample frequencies are sporadic and range from once per year to twice per month depending on the site and year. This database only contains data for chlorpyrifos. The sampling frequency and timing represented in the dataset do not specifically target chlorpyrifos applications; however, there are some sampling sites located within areas known to have high chlorpyrifos use. Because the sampling was not designed to monitor for chlorpyrifos, it is expected that the CDPR data underestimate chlorpyrifos concentrations. The magnitude of this underestimation is unknown. The Agency accessed the CDPR database and extracted the chlorpyrifos-specific results as part of a recent ecological assessment.[23] This included data from 1992 through June 2008. A summary of the data is provided here (not in **Appendix C**). All the data are provided in the aforementioned ecological assessment.

The maximum detection was 3.96 µg/L in 2003 from a sample taken from Quail Creek in Monterey County. Overall, 10 samples had concentrations greater than 1 µg/L; however, most of these samples were collected prior to 2000. Only three of the samples greater than 1 µg/L were collected post 2000, with most of the highest detections occurring in Monterey and Stanislaus counties. The samples with the highest concentrations typically occur in the spring and summer. CDPR data for chlorpyrifos in surface water are highlighted in **Table 21**.

23 *Risks of Chlorpyrifos Use to Federally Threatened & Endangered California red-legged frog, California tiger salamander, San Francisco garter snake, California clapper rail, Salt marsh harvest mouse, Bay checkerspot butterfly, Valley elderberry longhorn beetle, San Joaquin kit fox, California freshwater shrimp, and Delta smelt*; U.S. Environmental Protection Agency: Washington, DC, 2009

Table 21. CDPR Surface Water Monitoring Data for Chlorpyrifos

Parameter	Chlorpyrifos
Sampling Years	1991-2005
Number of Samples	7400
Sample Frequency	varied
Qualified Detections	1857
Frequency of Detections	25.1%
Maximum Detection	3.96 µg/L 2003 Monterey County, CA Quail Creek (ID # 7929)
LOD	

National Center for Water Quality Research at Heidelberg College

Recently EFED acquired chlorpyrifos monitoring data from National Center for Water Quality Research (NCWQR) at Heidelberg College. This dataset contains an extensive amount of surface water monitoring data from the Sandusky and Maumee Rivers in Ohio from 1983-1999. The Sandusky River is located in northern Ohio and drains into Lake Erie. Its watershed is contained within the Ohio boarder. The Maumee River has a larger watershed that includes several tributaries that extend into Indiana and Michigan. These monitoring sites were not selected based on known chlorpyrifos use, but are located in an agricultural area known to grow corn. The data currently available to EFED from this monitoring program were collected prior to the mitigation measures that were instituted in the RED. The application rates for corn used at the time the monitoring samples were collected is currently unknown, therefore it is not certain what use pattern and application rates the monitoring results represent. In general, sample frequencies ranged from daily to monthly. Sampling was much more frequent during the spring and summer months. These monitoring data have not gone through rigorous review, but are provided in **Table 22** as supplemental information. A full evaluation of the data will be completed for the final risk assessment. As shown in **Figure 13**, the NCWQR dataset underscores the need for monitoring programs to have frequent sampling in order to capture peak chlorpyrifos concentrations. These data also correspond well with the modeling time series data that suggest sporadic peaks. The peak concentration of 24 µg/L observed in the Maumee River (1992) is also similar to the 1-in-10 year peak concentration (30 µg/L) estimated for the modeled corn scenario. Additional analysis of this monitoring data is required in order to determine if the results represent currently registered uses of chlorpyrifos. At this time, the use of this monitoring data in quantitative risk assessment is not recommended, as the data have not been rigorously reviewed and it is unclear what chlorpyrifos use pattern is represented by the results.

Table 22. NCWQR Surface Water Monitoring Data for Chlorpyrifos.

Parameter	Chlorpyrifos	
Source	Sandusky River	Maumee River
Sampling Years	1983-1999	1983-1999
Number of Samples	1595	1435
Qualified Detections	147	100
Frequency of Detections	9.2%	7%
Maximum Detection	10.9 µg/L 1992	24.0 µg/L 1992

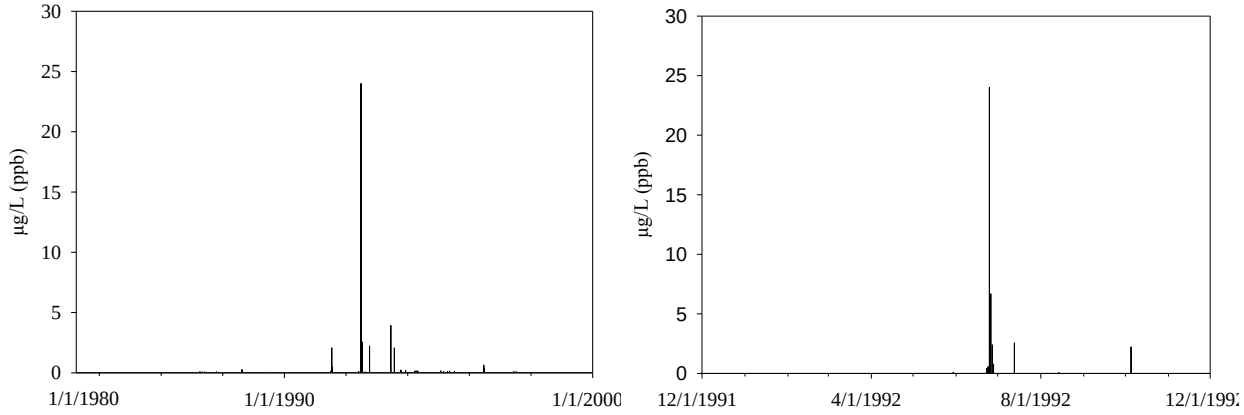


Figure 13. Chlorpyrifos Monitoring Data from National Center for Water Quality Research (NCWQR) at Heidelberg College from 1983-1999 (left) and 1992 only (right); Monitoring data have not been thoroughly review and is provided as supplemental data

Monitoring Data Conclusions

The reported chlorpyrifos and chlorpyrifos-oxon concentrations observed in monitoring studies are generally less than estimated concentrations derived from modeling. This result is attributed to the fact that water monitoring sampling programs do not specifically target chlorpyrifos use areas and may not represent high use areas; therefore, peak concentrations of chlorpyrifos and chlorpyrifos-oxon may go undetected. Moreover, sampling frequencies are generally not designed to capture peak concentrations. Furthermore, pest pressures change from year to year, resulting in changes to chlorpyrifos use patterns, which makes it difficult to determine sampling timing. These challenges make it problematic to predict when peak concentrations of chlorpyrifos may occur. These variables underscore the need for frequent sampling in order to detect peak concentrations of chlorpyrifos for use in exposure assessments. The NCWQR and model time series data support the need for frequent sampling. Therefore, the sporadic monitoring data presented above is not an appropriate estimation of the potential exposure to chlorpyrifos or chlorpyrifos-oxon resulting from chlorpyrifos use and at this time, without a thorough review of the NCWQR monitoring data, is not recommended for quantitative use. Therefore, EFED does **not** recommend that chlorpyrifos or chlorpyrifos-oxon water monitoring data be used by HED in the human health risk assessment.

In order to use monitoring data as an exposure endpoint for a chemical with an acute exposure concern like chlorpyrifos, sampling needs to be intensive (likely daily) in order to capture the peak exposure concentrations. This is based on time series data from the chlorpyrifos model runs as well as recommendations from the FIFRA Scientific Advisory Panel on atrazine drinking water monitoring frequency[24], and is supported by the NCWQR monitoring data. For example, the SAP stated that "if one wants 4-day rolling averages, then sampling must occur at least twice within the 4-day period. Simulations, models or any other approach that suggests otherwise are making some strong assumptions about what happens at the finer time scale."

Drinking Water Treatment

The potential impact of chlorpyrifos and chlorpyrifos-oxon concentrations on community drinking water supplies was analyzed by overlaying the chlorpyrifos use map shown in **Figure 2** with community watershed surface water intakes. The composite map shown in **Figure 14** underscores the potential impact of chlorpyrifos use on community drinking water supplies. There are several community watershed surface water intakes present in very high chlorpyrifos use regions.

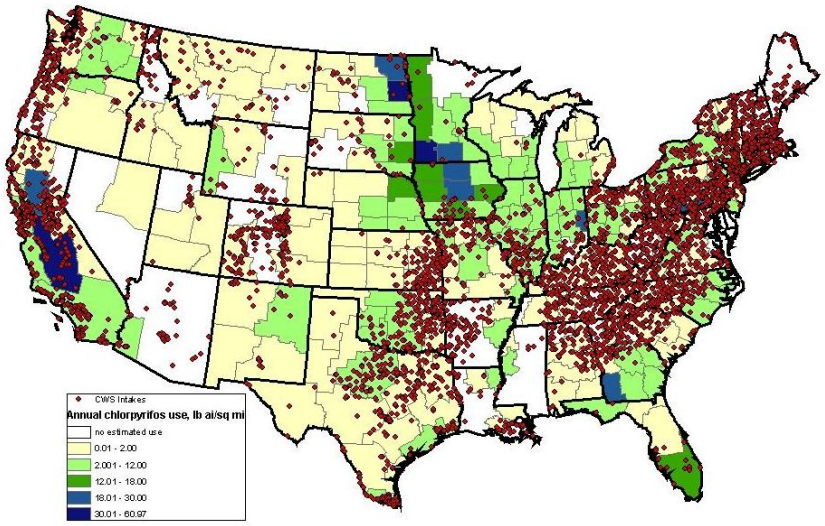


Figure 14. Co-occurrence of Chlorpyrifos Use and Community Watershed Surface Water Intakes; 2006-2008 Chlorpyrifos Use Spatial Distribution; BEAD agricultural chemical use data for chlorpyrifos[9]

In general, surface water treatment systems consist of pre-settling, coagulation/flocculation (sediment removal), granular filtration (sediment removal), corrosion control (pH adjustment or addition of corrosion inhibitors), and disinfection.[25,26,27] It is important to note that there are

24 *Re-evaluation of the Human Health Effects of Atrazine: Review of Experimental Animal and Invitro Studies and Drinking Water Monitroing Frequency*, FIFRA Scientific Advisory Panel Meeting, Sept 29, 2000; SAP Report No. 2010-04 April 26-29, 2010 .http://www.epa.gov/scipoly/sap/meetings/2010/april/042610minutes.pdf

25 M. Montgomery Consulting Engineers, Inc., Water Treatment: Design and Design; John Wiley & Sons: New York, 1985.

many variations on this common sequence with regards to points of addition of a wide variety of chemicals [*e.g.*, chlorine, ammonia, ozone, coagulants, filter aids, powder activated carbon (PAC), etc.]. The pre-settling process is a preliminary removal of materials, including non-colloidal sediment, from the raw water. The water is then treated with alum and polymers to encourage flocculation of the colloidal materials, including suspended sediment, and then allowed to settle. Next, the water is passed through a granular filter comprised of sand and possibly anthracite. After filtering, the water is conditioned to prevent corrosion and then disinfected using either chlorine or chloramines. A modification to the typical treatment process is the use of granular activated carbon (GAC) or PAC for the control of odors and taste in the finished water. This modification is applied through the filtration process either through the formation of a filtration bed using GAC or through the addition of PAC prior to coagulation /flocculation and filtration. The use of GAC has been shown to work well for removing pesticides; however, it is not a commonly used practice throughout the United States (<5%).[28] Available data from the 2006 community water system survey shows that chlorination is the predominate disinfection process used in drinking water treatment in the United States as shown in **Figure 15**.[29]

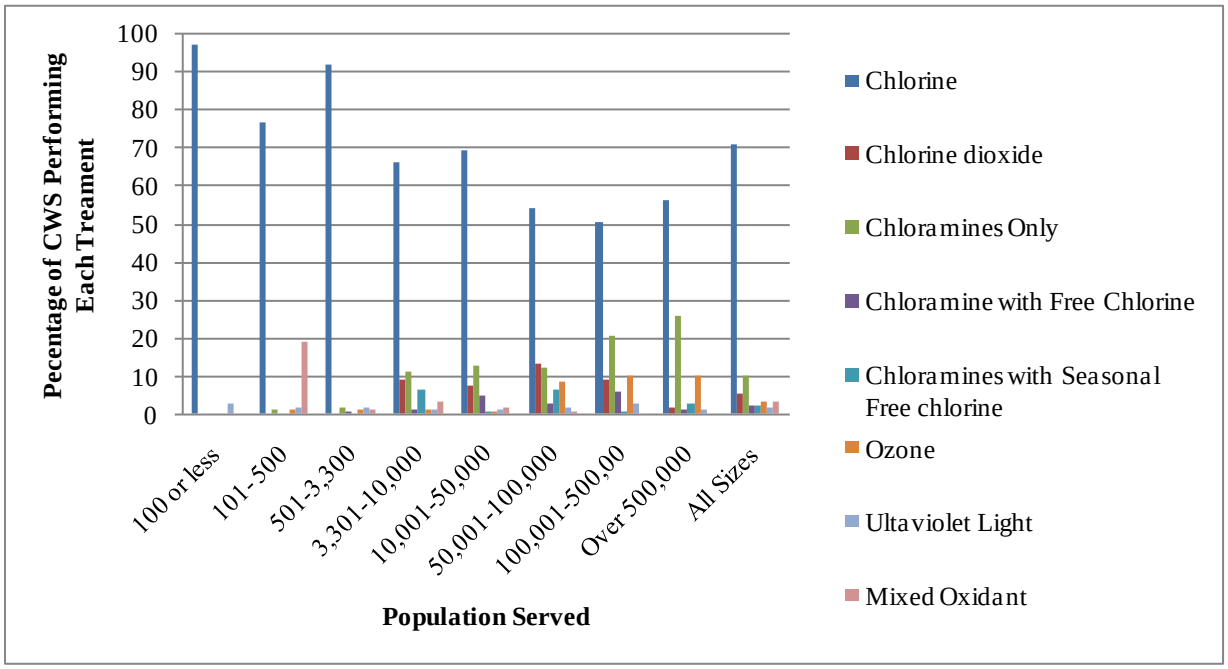


Figure 15. Types of Disinfection Processes Among Surface Source Water Community Water Systems

The time that source water is stored in a drinking water treatment facility could lead to additional degradation of chlorpyrifos or chlorpyrifos-oxon not taken into account in modeling. The

---

26 Faust, S.D.; Aly, O.M. Chemistry of Water Treatment 2nd Edition; Lewis Publishers: Boca Raton, FL, 1999.
27 *Technologies for Upgrading Existing or Designing New Drinking Water Treatment Facilities.* U.S. Environmental Protection Agency, 1989. EPA/625/4-89/023
28Community Water System Survey *1995*; U.S. Environmental Protection Agency, Washington, DC 20460
29 Community Water System Survey 2006; U.S. Environmental Protection Agency, Washington, DC 20460

average flow-through times at several drinking water treatment facilities that participated in the USGS-EPA Pilot Reservoir Monitoring Program range from 0.5 to 23 hours and the pH range from 6.9-9.2.[30] Based on laboratory data, substantial degradation of chlorpyrifos (hydrolysis $t_{1/2}$ = 39 days at pH 9) or chlorpyrifos-oxon (hydrolysis $t_{1/2}$ = 6 days at pH 9) is not expected under these conditions.

The use of multiple sources of water within a CWS could potentially lead to dilution of chlorpyrifos or chlorpyrifos-oxon in drinking water; however, this is difficult to predict as the amount of dilution is unknown. A CWS that pulls from two different surface water sources within the same watershed would be modeled the same way and would result in the same EDWCs. It is plausible, however, that the peak chlorpyrifos concentrations could enter the CWS at different times, resulting in a reduction of chlorpyrifos concentrations. For CWS that utilize both surface water and groundwater, the reported EDWCs may over estimate exposure as the concentrations in groundwater is expected to be low. Therefore, when surface water that contains chlorpyrifos is mixed with groundwater that has little to no chlorpyrifos, dilution would occur. The extent of this dilution is unknown. The degree to which CWS use multiple water sources to supply drinking water has not been investigated to date; however, it is not expected that all CWS use multiple sources. Therefore, use of a dilution factor is not recommended as it is not representative of CWS on a national basis.

Based on the information provided above, as well as the demonstrated formation and stability of chlorpyrifos-oxon during drinking water treatment[3], chlorpyrifos-oxon is expected to form during drinking water treatment and persist through distribution. Although there is monitoring data from USGS-EPA Pilot Reservoir Monitoring Program and USDA Pesticide Data Program that sampled both raw and finished drinking water, based on the deficiencies of the individual programs as discussed in the previous section of this document, EFED cautions against relying on these monitoring programs to predict potential exposure to chlorpyrifos-oxon. In addition, EFED is unaware of any monitoring data for chlorpyrifos or chlorpyrifos-oxon at the point of consumption (i.e., consumer tap water). Data on the removal efficiency of chlorpyrifos and chlorpyrifos-oxon during drinking water treatment is also not currently available. Both targeting monitoring and removal efficiency data would help EFED further refine the final drinking water assessment.

30 Pesticides in Selected Water-Supply Reservoirs and Finished Drinking Water, 1999-2000: Summary of Results from a Pilot Monitoring Program. U.S. Department of the Interior, Baltimore, MD.

APPENDIX A

PRZM-EXAMS Output Files

Only the output files for select scenarios are provided below. Primarily maximum application rate scenarios.

TX Alfalfa
stored as TXalfalfa.out
Chemical: Chlorpyrifos
PRZM environment: TXalfalfaOP.txt modified Thuday, 14 June 2007 at 11:23:54
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w13958.dvf modified Wedday, 3 July 2002 at 10:06:24
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	47.85	40.63	24.97	18.42	13.82	4.456
1962	21.27	18.1	11.36	6.859	5.609	3.047
1963	3.292	2.871	2.342	1.846	1.625	0.9498
1964	50.74	42.95	24.48	11.73	8.6	3.594
1965	15.52	13.23	8.21	5.012	4.364	2.592
1966	16.15	14.47	9.55	5.703	4.284	1.958
1967	8.333	7.589	5.008	4.336	4.161	1.983
1968	13.84	11.89	7.093	4.828	4.306	2.316
1969	12.59	11.16	8.57	4.903	3.874	2.017
1970	7.512	6.527	4.721	3.041	2.281	1.444
1971	17.43	15.74	9.761	5.032	3.96	1.749
1972	9.293	7.969	4.747	3.048	2.654	1.362
1973	21.22	19.16	14.95	9.708	7.332	3.124
1974	21.81	18.62	11.05	7.195	5.465	2.872
1975	17.18	15.27	11.16	9.317	7.396	3.327
1976	12.61	10.89	9.12	5.51	4.567	2.351
1977	4.205	3.597	2.575	1.643	1.503	1.016
1978	11.54	9.862	6.199	3.745	3.427	1.697
1979	34.79	29.86	22.36	11.98	9.919	3.868
1980	5.115	4.497	2.746	1.942	1.905	1.363
1981	66.14	60.27	40.84	22.66	17.11	5.799
1982	4.683	4.076	3.359	2.784	2.273	1.161
1983	6.609	5.711	4.084	3.263	3.096	1.511
1984	9.276	8.068	6.436	3.845	3.066	1.251
1985	16.27	13.97	8.82	5.945	4.521	2.376
1986	12.7	10.96	7.459	4.588	3.847	1.918
1987	26.91	23.39	18.61	12.5	9.529	3.712
1988	5.924	5.136	4.047	2.789	2.28	1.064
1989	8.159	7.43	4.905	3.59	2.728	1.243
1990	7.831	6.784	4.17	2.779	2.428	1.452

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly		
0.032258064516129			66.14	60.27	40.84	22.66	17.11	5.799
0.0645161290322581			50.74	42.95	24.97	18.42	13.82	4.456
0.0967741935483871			47.85	40.63	24.48	12.5	9.919	3.868
0.129032258064516			34.79	29.86	22.36	11.98	9.529	3.712
0.161290322580645			26.91	23.39	18.61	11.73	8.6	3.594
0.193548387096774			21.81	19.16	14.95	9.708	7.396	3.327
0.225806451612903			21.27	18.62	11.36	9.317	7.332	3.124

0.258064516129032	21.22	18.1	11.16	7.195	5.609	3.047	
0.290322580645161	17.43	15.74	11.05	6.859	5.465	2.872	
0.32258064516129	17.18	15.27	9.761	5.945	4.567	2.592	
0.354838709677419	16.27	14.47	9.55	5.703	4.521	2.376	
0.387096774193548	16.15	13.97	9.12	5.51	4.364	2.351	
0.419354838709677	15.52	13.23	8.82	5.032	4.306	2.316	
0.451612903225806	13.84	11.89	8.57	5.012	4.284	2.017	
0.483870967741936	12.7	11.16	8.21	4.903	4.161	1.983	
0.516129032258065	12.61	10.96	7.459	4.828	3.96	1.958	
0.548387096774194	12.59	10.89	7.093	4.588	3.874	1.918	
0.580645161290323	11.54	9.862	6.436	4.336	3.847	1.749	
0.612903225806452	9.293	8.068	6.199	3.845	3.427	1.697	
0.645161290322581	9.276	7.969	5.008	3.745	3.096	1.511	
0.67741935483871	8.333	7.589	4.905	3.59	3.066	1.452	
0.709677419354839	8.159	7.43	4.747	3.263	2.728	1.444	
0.741935483870968	7.831	6.784	4.721	3.048	2.654	1.363	
0.774193548387097	7.512	6.527	4.17	3.041	2.428	1.362	
0.806451612903226	6.609	5.711	4.084	2.789	2.281	1.251	
0.838709677419355	5.924	5.136	4.047	2.784	2.28	1.243	
0.870967741935484	5.115	4.497	3.359	2.779	2.273	1.161	
0.903225806451613	4.683	4.076	2.746	1.942	1.905	1.064	
0.935483870967742	4.205	3.597	2.575	1.846	1.625	1.016	
0.967741935483871	3.292	2.871	2.342	1.643	1.503	0.9498	

0.1	46.544	39.553	24.268	12.448	9.88	3.8524	
					Average of yearly averages:		2.28576

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: TXalfalfa
Metfile: w13958.dvf
PRZM scenario: TXalfalfaOP.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd Kd	Kd		mg/L	
Koc Koc	6040		mg/L	
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	2	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	1.1	kg/ha	
Application Efficiency:	APPEFF	0.95	fraction	
Spray Drift	DRFT	0.039	fraction of application rate applied to pond	
Application Date	Date	17-05	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	10	days	Set to 0 or delete line for single app.
app. rate 1	apprate	1.1	kg/ha	
Interval 2	interval	10	days	Set to 0 or delete line for single app.

app. rate 2	apprate	1.1	kg/ha	
Interval 3	interval	10	days	Set to 0 or delete line for single app.
app. rate 3	apprate	0.56	kg/ha	
Record 17:	FILTRA			
	IPSCND1			
	UPTKF			
Record 18:	PLVKRT			
	PLDKRT			
	FEXTRC	0.5		
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF		total	none, monthly or total(average of entire run)

CA Almond
stored as CAalmond_.out
Chemical: Chlorpyrifos
PRZM environment: CAalmond_WirrigSTD.txt modified Wedday, 13 June 2007 at 12:17:16
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w23232.dvf modified Wedday, 3 July 2002 at 10:04:22
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	6.567	5.661	4.754	3.864	3.391	1.932
1962	18.54	16.1	10.09	5.596	4.509	3.328
1963	19.2	16.92	12.46	9.412	7.931	4.084
1964	7.639	6.734	5.731	4.774	4.262	2.599
1965	7.386	6.519	5.255	4.162	3.759	2.193
1966	7.275	6.59	5.287	4.267	3.846	2.225
1967	9.624	8.541	7.339	5.663	5.263	2.885
1968	7.962	6.968	5.791	4.595	4.11	2.218
1969	7.722	6.751	5.611	4.497	4.09	2.43
1970	7.469	6.579	5.675	4.841	4.265	2.544
1971	7.953	7.053	5.504	4.398	3.942	2.27
1972	7.292	6.547	5.415	4.29	3.879	2.181
1973	8.491	7.4	5.971	4.79	4.349	2.481
1974	7.304	6.415	5.078	3.952	3.646	2.057
1975	9.436	8.212	6.676	4.879	4.323	2.223
1976	7.231	6.327	5.295	4.142	4.038	2.26
1977	6.93	6.059	5.242	4.445	3.799	2.281
1978	10.67	9.359	7.76	5.45	4.848	2.892
1979	7.636	6.705	5.715	4.652	4.121	2.467
1980	7.862	6.895	5.762	4.673	4.118	2.369
1981	8.506	7.476	6.052	4.654	4.098	2.38
1982	24.88	21.64	15.71	10.06	8.682	4.259
1983	14.7	12.79	9.629	6.683	6.009	2.944
1984	6.936	6.044	4.964	4.136	3.823	2.086
1985	6.904	6.05	4.991	4.016	3.655	2.064
1986	9.416	8.421	7.351	5.868	5.025	2.594
1987	10.55	9.158	7.444	5.488	4.748	2.365
1988	7.106	6.241	5.395	4.564	3.979	2.224
1989	8.619	7.499	6.42	4.86	4.229	2.27
1990	8.145	7.221	5.812	4.74	4.334	2.601

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.032258064516129		24.88	21.64	15.71	10.06	8.682	4.259
0.0645161290322581		19.2	16.92	12.46	9.412	7.931	4.084

0.0967741935483871	18.54	16.1	10.09	6.683	6.009	3.328
0.129032258064516	14.7	12.79	9.629	5.868	5.263	2.944
0.161290322580645	10.67	9.359	7.76	5.663	5.025	2.892
0.193548387096774	10.55	9.158	7.444	5.596	4.848	2.885
0.225806451612903	9.624	8.541	7.351	5.488	4.748	2.601
0.258064516129032	9.436	8.421	7.339	5.45	4.509	2.599
0.290322580645161	9.416	8.212	6.676	4.879	4.349	2.594
0.32258064516129	8.619	7.499	6.42	4.86	4.334	2.544
0.354838709677419	8.506	7.476	6.052	4.841	4.323	2.481
0.387096774193548	8.491	7.4	5.971	4.79	4.265	2.467
0.419354838709677	8.145	7.221	5.812	4.774	4.262	2.43
0.451612903225806	7.962	7.053	5.791	4.74	4.229	2.38
0.483870967741936	7.953	6.968	5.762	4.673	4.121	2.369
0.516129032258065	7.862	6.895	5.731	4.654	4.118	2.365
0.548387096774194	7.722	6.751	5.715	4.652	4.11	2.281
0.580645161290323	7.639	6.734	5.675	4.595	4.098	2.27
0.612903225806452	7.636	6.705	5.611	4.564	4.09	2.27
0.645161290322581	7.469	6.59	5.504	4.497	4.038	2.26
0.67741935483871	7.386	6.579	5.415	4.445	3.979	2.225
0.709677419354839	7.304	6.547	5.395	4.398	3.942	2.224
0.741935483870968	7.292	6.519	5.295	4.29	3.879	2.223
0.774193548387097	7.275	6.415	5.287	4.267	3.846	2.218
0.806451612903226	7.231	6.327	5.255	4.162	3.823	2.193
0.838709677419355	7.106	6.241	5.242	4.142	3.799	2.181
0.870967741935484	6.936	6.059	5.078	4.136	3.759	2.086
0.903225806451613	6.93	6.05	4.991	4.016	3.655	2.064
0.935483870967742	6.904	6.044	4.964	3.952	3.646	2.057
0.967741935483871	6.567	5.661	4.754	3.864	3.391	1.932

0.1	18.156	15.769	10.0439	6.6015	5.9344	3.2896

Average of yearly averages: 2.52353333333333

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: CAalmond_
Metfile: w23232.dvf
PRZM scenario: CAalmond_WirrigSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd Kd		mg/L		
Koc Koc	6040	mg/L		
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	2	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	1.1	kg/ha	
Application Efficiency:	APPEFF	0.95	fraction	

Spray Drift	DRFT	0.039	fraction of application rate applied to pond	
Application Date	Date	1-1	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	60	days	Set to 0 or delete line for single app.
app. rate 1	apprate	4.5	kg/ha	
Interval 2	interval	10	days	Set to 0 or delete line for single app.
app. rate 2	apprate	2.2	kg/ha	
Interval 3	interval	10	days	Set to 0 or delete line for single app.
app. rate 3	apprate	2.2	kg/ha	
Record 17:	FILTRA			
	IPSCND1			
	UPTKF			
Record 18:	PLVKRT			
	PLDKRT			
	FEXTRC	0.5		
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF		total	none, monthly or total(average of entire run)

NC Apple
stored as NC Apples _dormant spray (2 applications).out
Chemical: Chlorpyrifos
PRZM environment: NCappleSTD.txt modified Tueday, 29 May 2007 at 13:58:16
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w03812.dvf modified Wedday, 3 July 2002 at 10:05:50
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1965	8.678	7.65	5.096	4.373	3.938	1.758
1966	32.51	29.02	19.07	11.18	8.954	3.748
1967	6.547	5.732	4.198	3.112	2.803	1.9
1968	42.18	36.22	21.63	11.21	8.666	3.577
1969	12.35	10.71	7.052	4.982	4.52	2.185
1970	1.756	1.609	1.352	1.204	1.054	0.6316
1971	6.152	5.395	4.606	3.162	3.02	1.403
1972	7.145	6.213	3.913	2.738	2.566	1.528
1973	23.61	20.98	12.99	10.24	8.954	4.331
1974	9.201	8.001	5.507	3.928	4.04	1.958
1975	20.54	18.62	12.49	7.444	6.974	3.176
1976	18.6	16.3	9.872	5.732	5.363	2.896
1977	12.53	10.86	7.97	6.281	5.019	2.366
1978	47.12	41.68	26.21	15.51	12.94	5.091
1979	31.42	27.05	16.83	13.17	11.96	4.98
1980	14.99	13.63	10.87	7.068	5.905	2.385
1981	20.54	17.76	10.95	6.393	5.137	2.447
1982	30.69	26.63	17.6	12.54	10.21	4.052
1983	21.33	18.44	12.1	8.885	7.559	2.916
1984	27.52	23.74	16.83	11.36	9.395	3.855
1985	16.24	14.09	9.482	5.821	4.625	2.088
1986	3.892	3.377	2.203	1.482	1.266	0.9399
1987	21.55	18.66	11.41	6.477	5.596	2.828
1988	14.36	12.72	8.366	4.529	3.618	1.507
1989	9.963	8.645	5.246	3.403	3.122	1.713
1990	40.32	35.42	21.46	14.28	11.25	4.334

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.037037037037037		47.12	41.68	26.21	15.51	12.94	5.091

0.0740740740740741	42.18	36.22	21.63	14.28	11.96	4.98
0.111111111111111	40.32	35.42	21.46	13.17	11.25	4.334
0.148148148148148	32.51	29.02	19.07	12.54	10.21	4.331
0.185185185185185	31.42	27.05	17.6	11.36	9.395	4.052
0.222222222222222	30.69	26.63	16.83	11.21	8.954	3.855
0.259259259259259	27.52	23.74	16.83	11.18	8.954	3.748
0.296296296296296	23.61	20.98	12.99	10.24	8.666	3.577
0.333333333333333	21.55	18.66	12.49	8.885	7.559	3.176
0.37037037037037	21.33	18.62	12.1	7.444	6.974	2.916
0.407407407407407	20.54	18.44	11.41	7.068	5.905	2.896
0.444444444444444	20.54	17.76	10.95	6.477	5.596	2.828
0.481481481481481	18.6	16.3	10.87	6.393	5.363	2.447
0.518518518518518	16.24	14.09	9.872	6.281	5.137	2.385
0.555555555555556	14.99	13.63	9.482	5.821	5.019	2.366
0.592592592592593	14.36	12.72	8.366	5.732	4.625	2.185
0.62962962962963	12.53	10.86	7.97	4.982	4.52	2.088
0.666666666666667	12.35	10.71	7.052	4.529	4.04	1.958
0.703703703703704	9.963	8.645	5.507	4.373	3.938	1.9
0.740740740740741	9.201	8.001	5.246	3.928	3.618	1.758
0.777777777777778	8.678	7.65	5.096	3.403	3.122	1.713
0.814814814814815	7.145	6.213	4.606	3.162	3.02	1.528
0.851851851851852	6.547	5.732	4.198	3.112	2.803	1.507
0.888888888888889	6.152	5.395	3.913	2.738	2.566	1.403
0.925925925925926	3.892	3.377	2.203	1.482	1.266	0.9399
0.962962962962963	1.756	1.609	1.352	1.204	1.054	0.6316

0.1	40.878	35.66	21.511	13.503	11.463	4.5278

Average of yearly averages: 2.71513461538462

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: NC Apples _dormant spray (2 applications)
Metfile: w03812.dvf
PRZM scenario: NCappleSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable	Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol		
Henry's Law Const.		henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr		
Solubility	sol	1.4	mg/L		
Kd	Kd		mg/L		
Koc	Koc	6040	mg/L		
Photolysis half-life		kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism		kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism		kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife	
Hydrolysis:	pH 7	81	days	Half-life	
Method: CAM	1	integer	See PRZM manual		
Incorporation Depth:		DEPI	0	cm	
Application Rate:	TAPP	2.2	kg/ha		
Application Efficiency:		APPEFF	0.99	fraction	
Spray Drift	DRFT	0.01	fraction of application rate applied to pond		
Application Date	Date	1-1	dd/mm or dd/mmm or dd-mm or dd-mmm		
Interval 1	interval	10	days	Set to 0 or delete line for single app.	

app. rate 1 apprate 2.2 kg/ha
Record 17: FILTRA
IPSCND1
UPTKF
Record 18: PLVKRT
PLDKRT
FEXTRC 0.5
Flag for Index Res. Run IR Reservoir
Flag for runoff calc. RUNOFF total none, monthly or total(average of entire run)

MI Asparagus
stored as MIAsparagus_aerial.out
Chemical: Chlorpyrifos
PRZM environment: MIAsparagusSTDv2.txt modified Wedday, 22 October 2008 at 12:00:15
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w14840.dvf modified Wedday, 3 July 2002 at 10:05:38
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	3.835	3.304	2.397	1.45	1.098	0.4209
1962	3.892	3.36	2.456	1.509	1.148	0.4785
1963	4.028	3.51	2.85	1.882	1.447	0.5707
1964	3.89	3.357	2.453	1.503	1.138	0.4168
1965	7.398	6.355	3.784	1.962	1.501	0.7488
1966	4.042	3.502	2.599	1.634	1.255	0.587
1967	16.67	14.6	9.112	4.966	3.832	1.351
1968	4.06	3.522	2.62	1.654	1.273	0.5763
1969	3.904	3.363	2.46	1.505	1.145	0.4521
1970	3.868	3.332	2.428	1.483	1.123	0.4917
1971	3.91	3.375	2.471	1.519	1.154	0.4687
1972	8.139	7.059	4.383	2.915	2.32	1.017
1973	4.639	4.027	3.136	1.924	1.484	0.6666
1974	4.046	3.493	2.612	1.647	1.252	0.4586
1975	5.562	4.81	2.972	2.052	1.631	0.8616
1976	6.635	5.752	4.485	2.631	2.035	0.8065
1977	3.92	3.374	2.474	1.515	1.145	0.4543
1978	3.961	3.419	2.524	1.568	1.19	0.5142
1979	3.944	3.402	2.5	1.543	1.18	0.4714
1980	8.194	7.08	4.494	2.702	2.237	0.9745
1981	4.058	3.518	2.615	1.645	1.266	0.6911
1982	4.021	3.497	2.59	1.634	1.256	0.5778
1983	4.166	3.586	2.535	1.571	1.192	0.653
1984	5.984	5.188	3.982	2.277	1.747	0.6696
1985	3.884	3.351	2.448	1.505	1.176	0.5581
1986	15.34	13.14	7.98	4.346	3.309	1.287
1987	10.13	8.714	5.235	2.878	2.223	1.317
1988	4.085	3.537	2.638	1.664	1.277	0.759
1989	11.02	9.513	6.868	3.806	2.979	1.098
1990	3.993	3.441	2.547	1.582	1.209	0.5246

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.032258064516129		16.67	14.6	9.112	4.966	3.832	1.351
0.0645161290322581		15.34	13.14	7.98	4.346	3.309	1.317
0.0967741935483871		11.02	9.513	6.868	3.806	2.979	1.287
0.129032258064516		10.13	8.714	5.235	2.915	2.32	1.098

0.161290322580645	8.194	7.08	4.494	2.878	2.237	1.017
0.193548387096774	8.139	7.059	4.485	2.702	2.223	0.9745
0.225806451612903	7.398	6.355	4.383	2.631	2.035	0.8616
0.258064516129032	6.635	5.752	3.982	2.277	1.747	0.8065
0.290322580645161	5.984	5.188	3.784	2.052	1.631	0.759
0.32258064516129	5.562	4.81	3.136	1.962	1.501	0.7488
0.354838709677419	4.639	4.027	2.972	1.924	1.484	0.6911
0.387096774193548	4.166	3.586	2.85	1.882	1.447	0.6696
0.419354838709677	4.085	3.537	2.638	1.664	1.277	0.6666
0.451612903225806	4.06	3.522	2.62	1.654	1.273	0.653
0.483870967741936	4.058	3.518	2.615	1.647	1.266	0.587
0.516129032258065	4.046	3.51	2.612	1.645	1.256	0.5778
0.548387096774194	4.042	3.502	2.599	1.634	1.255	0.5763
0.580645161290323	4.028	3.497	2.59	1.634	1.252	0.5707
0.612903225806452	4.021	3.493	2.547	1.582	1.209	0.5581
0.645161290322581	3.993	3.441	2.535	1.571	1.192	0.5246
0.67741935483871	3.961	3.419	2.524	1.568	1.19	0.5142
0.709677419354839	3.944	3.402	2.5	1.543	1.18	0.4917
0.741935483870968	3.92	3.375	2.474	1.519	1.176	0.4785
0.774193548387097	3.91	3.374	2.471	1.515	1.154	0.4714
0.806451612903226	3.904	3.363	2.46	1.509	1.148	0.4687
0.838709677419355	3.892	3.36	2.456	1.505	1.145	0.4586
0.870967741935484	3.89	3.357	2.453	1.505	1.145	0.4543
0.903225806451613	3.884	3.351	2.448	1.503	1.138	0.4521
0.935483870967742	3.868	3.332	2.428	1.483	1.123	0.4209
0.967741935483871	3.835	3.304	2.397	1.45	1.098	0.4168

0.1	10.931	9.4331	6.7047	3.7169	2.9131	1.2681	
					Average of yearly averages:		0.697413333333333

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: MIAsparagus_aerial
Metfile: w14840.dvf
PRZM scenario: MIAsparagusSTDv2.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable	Name	Value	Units	Comments
Molecular weight		mwt	350.6	g/mol	
Henry's Law Const.		henry	6.2e-6	atm-m^3/mol	
Vapor Pressure		vapr	1.87e-5	torr	
Solubility		sol	1.4	mg/L	
Kd	Kd			mg/L	
Koc	Koc	6040		mg/L	
Photolysis half-life		kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism		kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism		kbacs	63	days	Halfife
Aerobic Soil Metabolism		asm	109	days	Halfife
Hydrolysis:	pH 7		81	days	Half-life
Method: CAM	2		integer	See PRZM manual	
Incorporation Depth:		DEPI	0	cm	
Application Rate:		TAPP	1.1	kg/ha	
Application Efficiency:		APPEFF	0.95	fraction	
Spray Drift		DRFT	0.039	fraction of application rate applied to pond	
Application Date		Date	15-5	dd/mm or dd/mmm or dd-mm or dd-mmm	

Interval 1	interval	10	days	Set to 0 or delete line for single app.
app. rate 1	apprate	1.7	kg/ha	
Interval 2	interval	10	days	Set to 0 or delete line for single app.
app. rate 2	apprate	1.7	kg/ha	
Record 17:	FILTRA			
	IPSCND	1		
	UPTKF			
Record 18:	PLVKRT			
	PLDKRT			
	FEXTRC	0.5		
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF		total	none, monthly or total(average of entire run)

MI Asparagus (granular)
stored as MIAsparagus_granular.out
Chemical: Chlorpyrifos
PRZM environment: MIAsparagusSTDv2.txt modified Wedday, 22 October 2008 at 12:00:15
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w14840.dvf modified Wedday, 3 July 2002 at 10:05:38
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	0.9173	0.7838	0.5488	0.295	0.2246	0.05958
1962	0.7434	0.6382	0.3779	0.1937	0.1484	0.07055
1963	0.9733	0.8456	0.5274	0.2929	0.256	0.1349
1964	0.08226	0.08082	0.07622	0.06958	0.06285	0.02886
1965	5.364	4.586	2.67	1.328	0.9958	0.2755
1966	0.6548	0.5595	0.3784	0.2915	0.2691	0.1552
1967	10.44	9.018	5.638	2.933	2.218	0.7305
1968	0.3701	0.3684	0.3597	0.3385	0.309	0.1453
1969	0.5553	0.4747	0.3134	0.1612	0.1216	0.04794
1970	1.183	1.058	0.6349	0.3164	0.2383	0.08358
1971	0.6348	0.5616	0.4393	0.1633	0.1124	0.06337
1972	4.637	3.998	2.421	1.29	1.178	0.4626
1973	1.47	1.283	0.8193	0.4792	0.3783	0.2448
1974	0.8282	0.7178	0.4449	0.2471	0.1922	0.08938
1975	3.936	3.381	2.028	1.153	0.8832	0.353
1976	5.211	4.509	2.741	1.47	1.127	0.4495
1977	0.1981	0.1971	0.1924	0.1806	0.1706	0.08538
1978	0.6611	0.5681	0.3387	0.2869	0.2315	0.09748
1979	0.3792	0.3322	0.2225	0.1532	0.1263	0.06255
1980	3.443	2.963	1.779	0.9324	0.9941	0.3995
1981	2.043	1.749	1.038	0.5482	0.448	0.2135
1982	1.033	0.8857	0.5243	0.2602	0.1838	0.129
1983	2.865	2.447	1.422	0.7194	0.5545	0.1932
1984	3.442	3.005	1.864	0.9957	0.7619	0.3023
1985	1.313	1.129	0.669	0.3785	0.3135	0.1482
1986	11.21	9.585	5.762	3.085	2.328	0.6798
1987	7.127	6.106	3.598	1.914	1.457	0.6852
1988	2.695	2.303	1.346	0.6877	0.5288	0.2884
1989	11.02	9.496	5.756	3.023	2.34	0.8013
1990	0.5287	0.4543	0.3158	0.2907	0.2706	0.1585

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.032258064516129		11.21	9.585	5.762	3.085	2.34	0.8013

0.0645161290322581	11.02	9.496	5.756	3.023	2.328	0.7305
0.0967741935483871	10.44	9.018	5.638	2.933	2.218	0.6852
0.129032258064516	7.127	6.106	3.598	1.914	1.457	0.6798
0.161290322580645	5.364	4.586	2.741	1.47	1.178	0.4626
0.193548387096774	5.211	4.509	2.67	1.328	1.127	0.4495
0.225806451612903	4.637	3.998	2.421	1.29	0.9958	0.3995
0.258064516129032	3.936	3.381	2.028	1.153	0.9941	0.353
0.290322580645161	3.443	3.005	1.864	0.9957	0.8832	0.3023
0.32258064516129	3.442	2.963	1.779	0.9324	0.7619	0.2884
0.354838709677419	2.865	2.447	1.422	0.7194	0.5545	0.2755
0.387096774193548	2.695	2.303	1.346	0.6877	0.5288	0.2448
0.419354838709677	2.043	1.749	1.038	0.5482	0.448	0.2135
0.451612903225806	1.47	1.283	0.8193	0.4792	0.3783	0.1932
0.483870967741936	1.313	1.129	0.669	0.3785	0.3135	0.1585
0.516129032258065	1.183	1.058	0.6349	0.3385	0.309	0.1552
0.548387096774194	1.033	0.8857	0.5488	0.3164	0.2706	0.1482
0.580645161290323	0.9733	0.8456	0.5274	0.295	0.2691	0.1453
0.612903225806452	0.9173	0.7838	0.5243	0.2929	0.256	0.1349
0.645161290322581	0.8282	0.7178	0.4449	0.2915	0.2383	0.129
0.67741935483871	0.7434	0.6382	0.4393	0.2907	0.2315	0.09748
0.709677419354839	0.6611	0.5681	0.3784	0.2869	0.2246	0.08938
0.741935483870968	0.6548	0.5616	0.3779	0.2602	0.1922	0.08538
0.774193548387097	0.6348	0.5595	0.3597	0.2471	0.1838	0.08358
0.806451612903226	0.5553	0.4747	0.3387	0.1937	0.1706	0.07055
0.838709677419355	0.5287	0.4543	0.3158	0.1806	0.1484	0.06337
0.870967741935484	0.3792	0.3684	0.3134	0.1633	0.1263	0.06255
0.903225806451613	0.3701	0.3322	0.2225	0.1612	0.1216	0.05958
0.935483870967742	0.1981	0.1971	0.1924	0.1532	0.1124	0.04794
0.967741935483871	0.08226	0.08082	0.07622	0.06958	0.06285	0.02886

0.1	10.1087	8.7268	5.434	2.8311	2.1419	0.68466

Average of yearly averages: 0.254629

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: MIAsparagus_granular
Metfile: w14840.dvf
PRZM scenario: MIAsparagusSTDv2.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd Kd	Kd		mg/L	
Koc Koc	Koc	6040	mg/L	
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	1	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	1.7	kg/ha	

Application Efficiency:	APPEFF	1	fraction	
Spray Drift	DRFT	0	fraction of application rate applied to pond	
Application Date	Date	15-5	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	10	days	Set to 0 or delete line for single app.
app. rate 1	apprate	1.7	kg/ha	
Record 17:	FILTRA			
	IPSCND	1		
	UPTKF			
Record 18:	PLVKRT			
	PLDKRT			
	FEXTRC	0.5		
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF		total	none, monthly or total(average of entire run)

MI Cherries
stored as MI Cherries-8x.out
Chemical: Chlorpyrifos
PRZM environment: MICherriesSTD.txt modified Tueday, 29 May 2007 at 13:56:56
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w14850.dvf modified Wedday, 3 July 2002 at 10:05:40
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	89.17	77.48	51.5	30.21	24.34	7.397
1962	40.62	35.88	25.14	16.28	14.16	9.263
1963	5.073	4.949	4.823	4.52	4.345	3.05
1964	46.32	40.87	26.24	17.14	14.15	5.517
1965	38.63	34.52	27.85	19.13	16.73	8.051
1966	31.03	27.5	18.54	12.95	11.36	7.791
1967	15.39	13.82	10.07	7.957	7.165	6.242
1968	17.88	15.84	10.94	8.065	6.948	4.644
1969	79.12	69.74	52.6	42.82	36.98	15.95
1970	65.02	57.76	39.52	33.36	27.55	13.83
1971	59.65	52.45	34.34	20.58	16.7	11.37
1972	82.52	72.34	51.33	33.39	29.37	14.57
1973	20.6	18.32	13.55	12.6	11.64	8.297
1974	29.43	25.99	17.57	14.26	13.32	6.994
1975	103	96.05	75.05	44.74	35.73	12.96
1976	41.28	36.45	24.23	14.9	13.45	9.834
1977	36.63	32.55	22.32	17.55	14.9	7.847
1978	67.43	59.1	39.48	25.09	20.61	9.527
1979	89.59	78.58	50.93	29.97	24.44	13.11
1980	19.43	17.45	12.82	10.1	9.572	7.248
1981	73.37	66.18	46	28.11	24.56	11.92
1982	119	107	69	39.91	31.86	15.26
1983	53.32	47.63	32.99	26.5	25.82	14.21
1984	64.74	57.01	37.73	23.46	20.38	11.78
1985	115	101	64.69	49.36	42.24	18.43
1986	87.96	78.28	65.17	50.64	45.55	25.07
1987	118	104	77.64	52.8	43.47	22.02
1988	18.72	18.59	18.05	16.87	16.03	9.766
1989	55.74	49.35	33.31	21.22	17.41	7.968
1990	46.42	41.44	34.3	23.5	24.19	11.93

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly

0.032258064516129	119	107	77.64	52.8	45.55	25.07
0.0645161290322581	118	104	75.05	50.64	43.47	22.02
0.0967741935483871	115	101	69	49.36	42.24	18.43
0.129032258064516	103	96.05	65.17	44.74	36.98	15.95
0.161290322580645	89.59	78.58	64.69	42.82	35.73	15.26
0.193548387096774	89.17	78.28	52.6	39.91	31.86	14.57
0.225806451612903	87.96	77.48	51.5	33.39	29.37	14.21
0.258064516129032	82.52	72.34	51.33	33.36	27.55	13.83
0.290322580645161	79.12	69.74	50.93	30.21	25.82	13.11
0.32258064516129	73.37	66.18	46	29.97	24.56	12.96
0.354838709677419	67.43	59.1	39.52	28.11	24.44	11.93
0.387096774193548	65.02	57.76	39.48	26.5	24.34	11.92
0.419354838709677	64.74	57.01	37.73	25.09	24.19	11.78
0.451612903225806	59.65	52.45	34.34	23.5	20.61	11.37
0.483870967741936	55.74	49.35	34.3	23.46	20.38	9.834
0.516129032258065	53.32	47.63	33.31	21.22	17.41	9.766
0.548387096774194	46.42	41.44	32.99	20.58	16.73	9.527
0.580645161290323	46.32	40.87	27.85	19.13	16.7	9.263
0.612903225806452	41.28	36.45	26.24	17.55	16.03	8.297
0.645161290322581	40.62	35.88	25.14	17.14	14.9	8.051
0.67741935483871	38.63	34.52	24.23	16.87	14.16	7.968
0.709677419354839	36.63	32.55	22.32	16.28	14.15	7.847
0.741935483870968	31.03	27.5	18.54	14.9	13.45	7.791
0.774193548387097	29.43	25.99	18.05	14.26	13.32	7.397
0.806451612903226	20.6	18.59	17.57	12.95	11.64	7.248
0.838709677419355	19.43	18.32	13.55	12.6	11.36	6.994
0.870967741935484	18.72	17.45	12.82	10.1	9.572	6.242
0.903225806451613	17.88	15.84	10.94	8.065	7.165	5.517
0.935483870967742	15.39	13.82	10.07	7.957	6.948	4.644
0.967741935483871	5.073	4.949	4.823	4.52	4.345	3.05

0.1	113.8	100.505	68.617	48.898	41.714	18.182

Average of yearly averages: 11.0615333333333

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: MI Cherries-8x
Metfile: w14850.dvf
PRZM scenario: MICherriesSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd Kd		mg/L		
Koc Koc	6040	mg/L		
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	2	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm	

Application Rate:	TAPP	1.7	kg/ha	
Application Efficiency:	APPEFF	0.99	fraction	
Spray Drift	DRFT	0.01	fraction of application rate applied to pond	
Application Date	Date	15-05	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	10	days	Set to 0 or delete line for single app.
app. rate 1	apprate	1.7	kg/ha	
Interval 2	interval	10	days	Set to 0 or delete line for single app.
app. rate 2	apprate	1.7	kg/ha	
Interval 3	interval	10	days	Set to 0 or delete line for single app.
app. rate 3	apprate	1.7	kg/ha	
Interval 4	interval	10	days	Set to 0 or delete line for single app.
app. rate 4	apprate	1.7	kg/ha	
Interval 5	interval	10	days	Set to 0 or delete line for single app.
app. rate 5	apprate	1.7	kg/ha	
Interval 6	interval	10	days	Set to 0 or delete line for single app.
app. rate 6	apprate	1.7	kg/ha	
Interval 7	interval	10	days	Set to 0 or delete line for single app.
app. rate 7	apprate	1.7	kg/ha	
Record 17:	FILTRA			
	IPSCND	1		
	UPTKF			
Record 18:	PLVKRT			
	PLDKRT			
	FEXTRC	0.5		
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)	

PA Christmas Trees
stored as PA Xmas trees.out
Chemical: Chlorpyrifos
PRZM environment: PAappleSTD_V2.txt modified Tueday, 20 May 2008 at 13:00:22
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w14751.dvf modified Wedday, 3 July 2002 at 10:06:14
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	19.11	17	10.58	5.735	4.531	1.364
1962	10.17	8.928	5.803	4.087	3.673	2.071
1963	5.548	4.83	3.264	2.725	2.212	1.488
1964	4.932	4.31	2.753	2.131	1.908	1.28
1965	4.989	4.357	2.782	2.056	1.817	1.147
1966	33.39	28.93	18.01	10.17	8.232	2.812
1967	6.199	5.593	4.368	3.507	3.43	2.232
1968	32.39	28.13	17.43	9.668	7.79	2.679
1969	3.904	3.518	3.29	2.94	2.696	1.705
1970	2.44	2.201	1.751	1.463	1.366	0.9645
1971	12.29	10.68	7.097	5.856	4.709	1.996
1972	7.034	6.214	4.986	3.599	2.822	2.136
1973	29.46	25.6	15.98	9.12	7.293	2.883
1974	19.2	17.03	12.01	7.095	5.796	3.193
1975	50.65	43.86	27.68	15.29	11.95	4.243
1976	20.27	17.68	11.54	7.286	6.085	3.591
1977	3.672	3.429	3.234	3.048	3.063	1.891
1978	2.656	2.427	1.852	1.691	1.638	1.092
1979	14.09	12.39	8.915	6.737	5.458	2.374
1980	6.932	6.063	4.026	2.849	2.138	1.462

1981	3.748	3.379	2.583	1.996	1.825	1.187
1982	2.09	1.869	1.411	1.071	0.9494	0.7886
1983	7.205	6.424	4.52	2.551	2.04	0.9792
1984	3.242	3.008	2.374	1.928	1.769	1.192
1985	9.827	8.549	5.363	3.342	2.951	1.213
1986	8.216	7.29	5.39	3.119	2.46	1.585
1987	16.32	14.37	11.03	6.776	5.857	2.353
1988	3.454	3.041	2.963	2.822	2.605	1.507
1989	14.41	12.54	7.83	4.689	4.478	1.789
1990	15.18	13.27	8.52	5.019	4.715	2.342

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly		
0.032258064516129			50.65	43.86	27.68	15.29	11.95	4.243
0.0645161290322581			33.39	28.93	18.01	10.17	8.232	3.591
0.0967741935483871			32.39	28.13	17.43	9.668	7.79	3.193
0.129032258064516			29.46	25.6	15.98	9.12	7.293	2.883
0.161290322580645			20.27	17.68	12.01	7.286	6.085	2.812
0.193548387096774			19.2	17.03	11.54	7.095	5.857	2.679
0.225806451612903			19.11	17	11.03	6.776	5.796	2.374
0.258064516129032			16.32	14.37	10.58	6.737	5.458	2.353
0.290322580645161			15.18	13.27	8.915	5.856	4.715	2.342
0.32258064516129			14.41	12.54	8.52	5.735	4.709	2.232
0.354838709677419			14.09	12.39	7.83	5.019	4.531	2.136
0.387096774193548			12.29	10.68	7.097	4.689	4.478	2.071
0.419354838709677			10.17	8.928	5.803	4.087	3.673	1.996
0.451612903225806			9.827	8.549	5.39	3.599	3.43	1.891
0.483870967741936			8.216	7.29	5.363	3.507	3.063	1.789
0.516129032258065			7.205	6.424	4.986	3.342	2.951	1.705
0.548387096774194			7.034	6.214	4.52	3.119	2.822	1.585
0.580645161290323			6.932	6.063	4.368	3.048	2.696	1.507
0.612903225806452			6.199	5.593	4.026	2.94	2.605	1.488
0.645161290322581			5.548	4.83	3.29	2.849	2.46	1.462
0.67741935483871			4.989	4.357	3.264	2.822	2.212	1.364
0.709677419354839			4.932	4.31	3.234	2.725	2.138	1.28
0.741935483870968			3.904	3.518	2.963	2.551	2.04	1.213
0.774193548387097			3.748	3.429	2.782	2.131	1.908	1.192
0.806451612903226			3.672	3.379	2.753	2.056	1.825	1.187
0.838709677419355			3.454	3.041	2.583	1.996	1.817	1.147
0.870967741935484			3.242	3.008	2.374	1.928	1.769	1.092
0.903225806451613			2.656	2.427	1.852	1.691	1.638	0.9792
0.935483870967742			2.44	2.201	1.751	1.463	1.366	0.9645
0.967741935483871			2.09	1.869	1.411	1.071	0.9494	0.7886
0.1	32.097	27.877	17.285	9.6132	7.7403	3.162		

Average of yearly averages: 1.91797666666667

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: PA Xmas trees
Metfile: w14751.dvf
PRZM scenario: PAappleSTD_V2.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments

Molecular weight	mwt	350.6	g/mol		
Henry's Law Const.		henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr		
Solubility	sol	1.4	mg/L		
Kd	Kd		mg/L		
Koc	Koc	6040	mg/L		
Photolysis half-life		kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism		kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism		kbacs	63	days	Halfife
Aerobic Soil Metabolism		asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life	
Method: CAM	2	integer	See PRZM manual		
Incorporation Depth:		DEPI	0	cm	
Application Rate:	TAPP	1.1	kg/ha		
Application Efficiency:		APPEFF	0.99	fraction	
Spray Drift	DRFT	0.01	fraction of application rate applied to pond		
Application Date	Date	01-08	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.	
app. rate 1	apprate	1.1	kg/ha		
Interval 2	interval	7	days	Set to 0 or delete line for single app.	
app. rate 2	apprate	1.1	kg/ha		
Record 17:	FILTRA				
	IPSCND	1			
	UPTKF				
Record 18:	PLVKRT				
	PLDKRT				
	FEXTRC	0.5			
Flag for Index Res. Run		IR	Reservoir		
Flag for runoff calc.		RUNOFF	total	none, monthly or total(average of entire run)	

OR Christmas Trees
stored as OR Xmas trees.out
Chemical: Chlorpyrifos
PRZM environment: ORXmasTreeSTD.txt modified Tueday, 21 February 2006 at 15:39:00
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w24232.dvf modified Wedday, 3 July 2002 at 10:06:10
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	1.394	1.208	0.6089	0.3346	0.2746	0.1165
1962	2.954	2.55	1.596	0.8747	0.7447	0.3656
1963	1.916	1.671	1.124	0.7956	0.6147	0.4916
1964	5.252	4.674	2.263	1.081	0.7735	0.4922
1965	2.643	2.337	1.612	1.38	1.138	0.644
1966	2.729	2.453	1.705	1.008	0.9086	0.5701
1967	2.04	1.796	1.186	0.7371	0.6318	0.4396
1968	2.553	2.305	1.664	1.13	1.133	0.6593
1969	2.674	2.343	1.56	1.259	0.9717	0.6056
1970	2.463	1.503	1.128	1.05	0.93	0.5602
1971	2.484	2.158	1.342	0.8447	0.7599	0.545
1972	3.047	2.654	1.676	1.037	0.8496	0.4993
1973	4.502	3.882	2.576	1.761	1.226	0.5513
1974	3.096	2.848	1.963	1.335	1.133	0.6884
1975	1.496	1.315	0.885	0.6451	0.5563	0.4179
1976	0.8881	0.8305	0.624	0.4778	0.4565	0.2825
1977	2.383	2.125	1.497	0.9589	0.6931	0.2618

1978	1.257	1.118	0.8734	0.6393	0.5486	0.3728
1979	2.377	2.065	1.278	0.7885	0.6982	0.3869
1980	4.635	4.06	2.502	1.566	1.095	0.5409
1981	3.04	2.678	2.026	1.619	1.535	0.8785
1982	1.883	1.653	1.248	0.9573	0.8664	0.5774
1983	1.189	1.08	0.842	0.7103	0.6613	0.4868
1984	3.242	2.806	1.911	1.43	1.054	0.4915
1985	1.297	1.134	0.7262	0.5574	0.5076	0.3821
1986	1.326	1.154	0.8687	0.4694	0.3537	0.278
1987	5.085	4.44	3.492	1.538	1.068	0.4857
1988	2.236	2.002	1.607	1.144	0.9689	0.5775
1989	4.457	3.885	2.425	1.196	0.8937	0.4437
1990	1.762	1.605	1.154	0.9973	0.846	0.5406

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly		
0.032258064516129			5.252	4.674	3.492	1.761	1.535	0.8785
0.0645161290322581			5.085	4.44	2.576	1.619	1.226	0.6884
0.0967741935483871			4.635	4.06	2.502	1.566	1.138	0.6593
0.129032258064516			4.502	3.885	2.425	1.538	1.133	0.644
0.161290322580645			4.457	3.882	2.263	1.43	1.133	0.6056
0.193548387096774			3.242	2.848	2.026	1.38	1.095	0.5775
0.225806451612903			3.096	2.806	1.963	1.335	1.068	0.5774
0.258064516129032			3.047	2.678	1.911	1.259	1.054	0.5701
0.290322580645161			3.04	2.654	1.705	1.196	0.9717	0.5602
0.32258064516129			2.954	2.55	1.676	1.144	0.9689	0.5513
0.354838709677419			2.729	2.453	1.664	1.13	0.93	0.545
0.387096774193548			2.674	2.343	1.612	1.081	0.9086	0.5409
0.419354838709677			2.643	2.337	1.607	1.05	0.8937	0.5406
0.451612903225806			2.553	2.305	1.596	1.037	0.8664	0.4993
0.483870967741936			2.484	2.158	1.56	1.008	0.8496	0.4922
0.516129032258065			2.463	2.125	1.497	0.9973	0.846	0.4916
0.548387096774194			2.383	2.065	1.342	0.9589	0.7735	0.4915
0.580645161290323			2.377	2.002	1.278	0.9573	0.7599	0.4868
0.612903225806452			2.236	1.796	1.248	0.8747	0.7447	0.4857
0.645161290322581			2.04	1.671	1.186	0.8447	0.6982	0.4437
0.67741935483871			1.916	1.653	1.154	0.7956	0.6931	0.4396
0.709677419354839			1.883	1.605	1.128	0.7885	0.6613	0.4179
0.741935483870968			1.762	1.503	1.124	0.7371	0.6318	0.3869
0.774193548387097			1.496	1.315	0.885	0.7103	0.6147	0.3821
0.806451612903226			1.394	1.208	0.8734	0.6451	0.5563	0.3728
0.838709677419355			1.326	1.154	0.8687	0.6393	0.5486	0.3656
0.870967741935484			1.297	1.134	0.842	0.5574	0.5076	0.2825
0.903225806451613			1.257	1.118	0.7262	0.4778	0.4565	0.278
0.935483870967742			1.189	1.08	0.624	0.4694	0.3537	0.2618
0.967741935483871			0.8881	0.8305	0.6089	0.3346	0.2746	0.1165

0.1	4.6217	4.0425	2.4943	1.5632	1.1375	0.65777

Average of yearly averages: 0.487776666666667

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: OR Xmas trees
Metfile: w24232.dvf
PRZM scenario: ORXmasTreeSTD.txt

EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd Kd		mg/L		
Koc Koc	6040	mg/L		
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis: pH 7	81	days	Half-life	
Method: CAM 2	integer	See PRZM manual		
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	1.1	kg/ha	
Application Efficiency:	APPEFF	0.99	fraction	
Spray Drift	DRFT	0.01	fraction of application rate applied to pond	
Application Date	Date	01-08	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.
app. rate 1	apprate	1.1	kg/ha	
Interval 2	interval	7	days	Set to 0 or delete line for single app.
app. rate 2	apprate	1.1	kg/ha	
Record 17:	FILTRA			
IPSCND1				
UPTKF				
Record 18:	PLVKRT			
PLDKRT				
FEXTRC	0.5			
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)	

FL Citrus
stored as FLcitrus_ground.out
Chemical: Chlorpyrifos
PRZM environment: FLcitrusSTD.txt modified Tueday, 29 May 2007 at 13:45:56
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w12844.dvf modified Wedday, 3 July 2002 at 10:04:30
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	13.79	11.91	9.526	5.843	5.15	1.677
1962	39.61	36.42	24.33	13.34	10.4	4.211
1963	91.15	80.38	55.09	31.54	25.17	8.183
1964	96.49	87.37	60.5	40.41	35.1	14.02
1965	128	110	82.57	51.88	38.27	13.19
1966	33.83	29.76	19.74	15.18	13.85	9.45
1967	57.54	50.08	32.64	22.7	18.04	7.375
1968	84.69	74.32	54.53	35.03	27.3	11.45
1969	49.13	43.44	31.05	26.88	22.71	10.27
1970	16.84	15.32	12.37	9.463	9.707	5.837
1971	61.51	52.99	33.69	17.93	14.4	5.235
1972	63.86	55.14	33.35	17.24	12.64	6.918
1973	24.47	23.08	16.05	12.66	10.36	5.018
1974	57.86	49.64	32.28	18.48	14.86	6.598

1975	63.85	55.35	37.84	21.95	17.08	6.081
1976	35.07	31.74	21.05	16	14.39	6.54
1977	39.99	35.08	24.96	15.66	13.2	7.302
1978	58.17	53.7	37.89	22.33	18.95	7.775
1979	79.78	68.62	50.68	32.05	24.79	10.05
1980	20.09	17.4	12.67	9.782	8.309	5.797
1981	46.03	42.11	28.58	22.59	20.84	7.872
1982	73.45	64.45	50.45	29.8	24.45	11.73
1983	53.05	45.74	28.5	22.92	18.58	10.25
1984	87.04	77.76	48.7	26.51	21.57	9.841
1985	29.11	25.14	19.16	11.66	8.861	6.09
1986	36.11	31.46	20.26	16.59	13.79	6.188
1987	59.46	51.53	37.18	30.37	25.17	9.618
1988	56.45	48.79	29.68	18.49	16.19	7.892
1989	13.5	11.7	9.023	5.854	4.7	2.939
1990	59.1	51.06	37.67	21.72	17.3	6.247

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly		
0.032258064516129			128	110	82.57	51.88	38.27	14.02
0.0645161290322581			96.49	87.37	60.5	40.41	35.1	13.19
0.0967741935483871			91.15	80.38	55.09	35.03	27.3	11.73
0.129032258064516			87.04	77.76	54.53	32.05	25.17	11.45
0.161290322580645			84.69	74.32	50.68	31.54	25.17	10.27
0.193548387096774			79.78	68.62	50.45	30.37	24.79	10.25
0.225806451612903			73.45	64.45	48.7	29.8	24.45	10.05
0.258064516129032			63.86	55.35	37.89	26.88	22.71	9.841
0.290322580645161			63.85	55.14	37.84	26.51	21.57	9.618
0.32258064516129			61.51	53.7	37.67	22.92	20.84	9.45
0.354838709677419			59.46	52.99	37.18	22.7	18.95	8.183
0.387096774193548			59.1	51.53	33.69	22.59	18.58	7.892
0.419354838709677			58.17	51.06	33.35	22.33	18.04	7.872
0.451612903225806			57.86	50.08	32.64	21.95	17.3	7.775
0.483870967741936			57.54	49.64	32.28	21.72	17.08	7.375
0.516129032258065			56.45	48.79	31.05	18.49	16.19	7.302
0.548387096774194			53.05	45.74	29.68	18.48	14.86	6.918
0.580645161290323			49.13	43.44	28.58	17.93	14.4	6.598
0.612903225806452			46.03	42.11	28.5	17.24	14.39	6.54
0.645161290322581			39.99	36.42	24.96	16.59	13.85	6.247
0.67741935483871			39.61	35.08	24.33	16	13.79	6.188
0.709677419354839			36.11	31.74	21.05	15.66	13.2	6.09
0.741935483870968			35.07	31.46	20.26	15.18	12.64	6.081
0.774193548387097			33.83	29.76	19.74	13.34	10.4	5.837
0.806451612903226			29.11	25.14	19.16	12.66	10.36	5.797
0.838709677419355			24.47	23.08	16.05	11.66	9.707	5.235
0.870967741935484			20.09	17.4	12.67	9.782	8.861	5.018
0.903225806451613			16.84	15.32	12.37	9.463	8.309	4.211
0.935483870967742			13.79	11.91	9.526	5.854	5.15	2.939
0.967741935483871			13.5	11.7	9.023	5.843	4.7	1.677
0.1	90.739	80.118	55.034	34.732	27.087	11.702		

Average of yearly averages: 7.72146666666667

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:

Output File: FLcitrus_ground
Metfile: w12844.dvf
PRZM scenario: FLcitrusSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	4.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.82-5	torr	
Solubility	sol	2	mg/L	
Kd Kd		mg/L		
Koc Koc	6040	mg/L		
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis: pH 7	81	days	Half-life	
Method: CAM 2	integer	See PRZM manual		
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	3.9	kg/ha	
Application Efficiency:	APPEFF	0.99	fraction	
Spray Drift	DRFT	0.01	fraction of application rate applied to pond	
Application Date	Date	10-8	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	30	days	Set to 0 or delete line for single app.
app. rate 1	apprate	3.9	kg/ha	
Interval 2	interval	10	days	Set to 0 or delete line for single app.
app. rate 2	apprate	1.1	kg/ha	
Interval 3	interval	10	days	Set to 0 or delete line for single app.
app. rate 3	apprate	1.1	kg/ha	
Interval 4	interval	10	days	Set to 0 or delete line for single app.
app. rate 4	apprate	1.1	kg/ha	
Record 17:	FILTRA			
IPSCND1				
UPTKF				
Record 18:	PLVKRT			
PLDKRT				
FEXTRC	0.5			
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)	

FL Cabbage
stored as FLCabbage_air.out
Chemical: Chlorpyrifos
PRZM environment: FLcabbageSTD.txt modified Thuday, 24 May 2007 at 10:40:46
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w12842.dvf modified Wedday, 3 July 2002 at 10:04:28
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	9.841	8.484	6.204	4.822	3.895	2.283
1962	38.45	33.17	20.2	16.21	12.45	5.67
1963	20.17	17.58	11.43	9.013	7.938	5.434
1964	34.52	30.64	24.95	20.19	17.29	9.5
1965	23.89	20.49	15.02	11.76	11.35	6.074
1966	26.57	24.45	15.07	10.33	9.477	5.201
1967	37.87	33.38	24.11	15.15	12.81	5.775

1968	24.43	22.04	16.62	11.87	12.05	6.403
1969	28.13	24.24	17.55	14.74	13.33	8.411
1970	15.54	13.76	11.15	8.101	6.478	5.112
1971	51.49	46.18	30.16	19.55	17.06	8.641
1972	32.88	28.35	22.9	13.74	12.13	6.638
1973	25.93	22.4	17.75	13.54	10.92	5.429
1974	61.44	52.51	31.62	17.17	14.75	5.891
1975	28.32	24.6	19.26	14.85	12.62	6.646
1976	46.7	40.97	26.24	18.12	14.62	7.047
1977	13.63	11.89	9.814	7.596	6.525	3.444
1978	16.93	15.01	10.09	6.486	5.813	4.617
1979	114	100	63.22	33.63	26.13	13.81
1980	16.41	14.3	12.13	9.572	8.739	5.537
1981	30.94	26.88	18.36	15.29	11.76	7.183
1982	35.17	30.86	22.59	19.24	17.12	9.71
1983	31.07	26.82	18.94	13.79	12.86	8.137
1984	18.73	16.14	11.44	8.888	7.792	4.776
1985	66.97	58.6	35.97	20.98	17.25	7.841
1986	18.69	16.38	10.72	7.614	7.163	5.245
1987	28.74	24.92	16.1	11.73	10.61	7.273
1988	69.63	59.79	40.25	25.71	20.01	8.818
1989	28.81	25.1	20.36	13.97	12.37	6.329
1990	22.87	19.76	14.12	9.449	7.974	4.701

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly		
0.032258064516129		114	100	63.22	33.63	26.13	13.81	
0.0645161290322581		69.63	59.79	40.25	25.71	20.01	9.71	
0.0967741935483871		66.97	58.6	35.97	20.98	17.29	9.5	
0.129032258064516		61.44	52.51	31.62	20.19	17.25	8.818	
0.161290322580645		51.49	46.18	30.16	19.55	17.12	8.641	
0.193548387096774		46.7	40.97	26.24	19.24	17.06	8.411	
0.225806451612903		38.45	33.38	24.95	18.12	14.75	8.137	
0.258064516129032		37.87	33.17	24.11	17.17	14.62	7.841	
0.290322580645161		35.17	30.86	22.9	16.21	13.33	7.273	
0.32258064516129		34.52	30.64	22.59	15.29	12.86	7.183	
0.354838709677419		32.88	28.35	20.36	15.15	12.81	7.047	
0.387096774193548		31.07	26.88	20.2	14.85	12.62	6.646	
0.419354838709677		30.94	26.82	19.26	14.74	12.45	6.638	
0.451612903225806		28.81	25.1	18.94	13.97	12.37	6.403	
0.483870967741936		28.74	24.92	18.36	13.79	12.13	6.329	
0.516129032258065		28.32	24.6	17.75	13.74	12.05	6.074	
0.548387096774194		28.13	24.45	17.55	13.54	11.76	5.891	
0.580645161290323		26.57	24.24	16.62	11.87	11.35	5.775	
0.612903225806452		25.93	22.4	16.1	11.76	10.92	5.67	
0.645161290322581		24.43	22.04	15.07	11.73	10.61	5.537	
0.67741935483871		23.89	20.49	15.02	10.33	9.477	5.434	
0.709677419354839		22.87	19.76	14.12	9.572	8.739	5.429	
0.741935483870968		20.17	17.58	12.13	9.449	7.974	5.245	
0.774193548387097		18.73	16.38	11.44	9.013	7.938	5.201	
0.806451612903226		18.69	16.14	11.43	8.888	7.792	5.112	
0.838709677419355		16.93	15.01	11.15	8.101	7.163	4.776	
0.870967741935484		16.41	14.3	10.72	7.614	6.525	4.701	
0.903225806451613		15.54	13.76	10.09	7.596	6.478	4.617	
0.935483870967742		13.63	11.89	9.814	6.486	5.813	3.444	
0.967741935483871		9.841	8.484	6.204	4.822	3.895	2.283	

0.1	66.417	57.991	35.535	20.901	17.286	9.4318

Average of yearly averages: 6.58586666666667

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: FLCabbage_air
Metfile: w12842.dvf
PRZM scenario: FLcabbageSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable	Name	Value	Units	Comments
Molecular weight		mwt	350.6	g/mol	
Henry's Law Const.		henry	6.7e-6	atm-m^3/mol	
Vapor Pressure		vapr	2.02e-5	torr	
Solubility		sol	1.4	mg/L	
Kd	Kd			mg/L	
Koc	Koc	6040		mg/L	
Photolysis half-life		kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism		kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism		kbacs	63	days	Halfife
Aerobic Soil Metabolism		asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life	
Method: CAM	1	integer	See PRZM manual		
Incorporation Depth:		DEPI	0	cm	
Application Rate:		TAPP	1.1	kg/ha	
Application Efficiency:		APPEFF	0.95	fraction	
Spray Drift		DRFT	0.039	fraction of application rate applied to pond	
Application Date		Date	1-1	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1		interval	10	days	Set to 0 or delete line for single app.
app. rate 1		apprate	1.1	kg/ha	
Interval 2		interval	10	days	Set to 0 or delete line for single app.
app. rate 2		apprate	1.1	kg/ha	
Interval 3		interval	90	days	Set to 0 or delete line for single app.
app. rate 3		apprate	1.1	kg/ha	
Interval 4		interval	10	days	Set to 0 or delete line for single app.
app. rate 4		apprate	1.1	kg/ha	
Interval 5		interval	10	days	Set to 0 or delete line for single app.
app. rate 5		apprate	1.1	kg/ha	
Interval 6		interval	90	days	Set to 0 or delete line for single app.
app. rate 6		apprate	1.1	kg/ha	
Interval 7		interval	10	days	Set to 0 or delete line for single app.
app. rate 7		apprate	1.1	kg/ha	
Interval 8		interval	10	days	Set to 0 or delete line for single app.
app. rate 8		apprate	1.1	kg/ha	
Record 17:		FILTRA			
		IPSCND	1		
		UPTKF			
Record 18:		PLVKRT			
		PLDKRT			
		FEXTRC	0.5		
Flag for Index Res. Run		IR	Reservoir		
Flag for runoff calc.		RUNOFF		total	none, monthly or total(average of entire run)

KS Corn

stored as KScorn_aerial.out
Chemical: Chlorpyrifos
PRZM environment: KSCornStd.txt modified Monday, 25 August 2008 at 15:45:08
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w13996.dvf modified Wedday, 3 July 2002 at 10:04:44
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	11.58	10.04	7.046	4.596	4.183	2.007
1962	17.5	14.97	10.3	7.403	6.66	3.356
1963	10.02	8.658	5.322	3.474	3.17	1.64
1964	19	16.48	12.79	7.671	6.868	3.259
1965	15.86	14.45	10.92	9.128	7.359	3.67
1966	27.34	24.13	15.76	9.278	7.458	3.01
1967	41.82	37.31	27.8	17.54	13.9	5.448
1968	22.3	19.46	16.34	10.48	9.072	4.448
1969	17.77	15.84	14.33	8.917	7.125	3.338
1970	15.09	13.16	9.721	6.019	4.711	2.391
1971	6.727	5.868	3.958	3.099	2.603	1.581
1972	8.942	7.802	4.995	3.703	3.517	2.006
1973	26.42	22.87	14.75	9.081	9.267	5.075
1974	16.01	14.03	9.008	5.83	5.068	3.261
1975	14.01	12.85	8.623	5.463	4.298	2.357
1976	4.907	4.33	3.495	2.544	2.321	1.265
1977	37.34	32.33	21.72	12.61	10.94	4.623
1978	19.57	17.79	12.76	9.175	7.798	3.978
1979	15.32	13.33	10.88	7.216	6.588	3.353
1980	13.79	12	9.09	5.113	4.746	2.961
1981	17.92	15.72	12.27	10.69	9.377	4.33
1982	15.51	13.57	10.13	7.873	6.777	3.336
1983	9.469	8.667	5.659	4.147	3.455	2.044
1984	31.3	26.98	18.97	11.39	9.012	3.589
1985	14.36	13.14	9.125	6.344	6.243	3.444
1986	10.23	9.097	6.253	4.913	4.437	2.885
1987	10.12	8.901	7.089	5.909	4.994	2.676
1988	11	9.893	6.949	4.097	3.602	1.749
1989	19.96	17.59	11.88	7.722	7.162	3.399
1990	12.23	10.69	7.637	6.053	5.893	3.224

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly		
0.032258064516129			41.82	37.31	27.8	17.54	13.9	5.448
0.0645161290322581			37.34	32.33	21.72	12.61	10.94	5.075
0.0967741935483871			31.3	26.98	18.97	11.39	9.377	4.623
0.129032258064516			27.34	24.13	16.34	10.69	9.267	4.448
0.161290322580645			26.42	22.87	15.76	10.48	9.072	4.33
0.193548387096774			22.3	19.46	14.75	9.278	9.012	3.978
0.225806451612903			19.96	17.79	14.33	9.175	7.798	3.67
0.258064516129032			19.57	17.59	12.79	9.128	7.458	3.589
0.290322580645161			19	16.48	12.76	9.081	7.359	3.444
0.32258064516129			17.92	15.84	12.27	8.917	7.162	3.399
0.354838709677419			17.77	15.72	11.88	7.873	7.125	3.356
0.387096774193548			17.5	14.97	10.92	7.722	6.868	3.353
0.419354838709677			16.01	14.45	10.88	7.671	6.777	3.338
0.451612903225806			15.86	14.03	10.3	7.403	6.66	3.336
0.483870967741936			15.51	13.57	10.13	7.216	6.588	3.261

0.516129032258065	15.32	13.33	9.721	6.344	6.243	3.259
0.548387096774194	15.09	13.16	9.125	6.053	5.893	3.224
0.580645161290323	14.36	13.14	9.09	6.019	5.068	3.01
0.612903225806452	14.01	12.85	9.008	5.909	4.994	2.961
0.645161290322581	13.79	12	8.623	5.83	4.746	2.885
0.67741935483871	12.23	10.69	7.637	5.463	4.711	2.676
0.709677419354839	11.58	10.04	7.089	5.113	4.437	2.391
0.741935483870968	11	9.893	7.046	4.913	4.298	2.357
0.774193548387097	10.23	9.097	6.949	4.596	4.183	2.044
0.806451612903226	10.12	8.901	6.253	4.147	3.602	2.007
0.838709677419355	10.02	8.667	5.659	4.097	3.517	2.006
0.870967741935484	9.469	8.658	5.322	3.703	3.455	1.749
0.903225806451613	8.942	7.802	4.995	3.474	3.17	1.64
0.935483870967742	6.727	5.868	3.958	3.099	2.603	1.581
0.967741935483871	4.907	4.33	3.495	2.544	2.321	1.265

0.1	30.904	26.695	18.707	11.32	9.366	4.6055

Average of yearly averages: 3.12343333333333

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: KScorn_aerial
Metfile: w13996.dvf
PRZM scenario: KSCornStd.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd Kd		mg/L		
Koc Koc	6040	mg/L		
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	2	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	1.1	kg/ha	
Application Efficiency:	APPEFF	0.95	fraction	
Spray Drift	DRFT	0.039	fraction of application rate applied to pond	
Application Date	Date	15-5	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	10	days	Set to 0 or delete line for single app.
app. rate 1	apprate	1.1	kg/ha	
Interval 2	interval	10	days	Set to 0 or delete line for single app.
app. rate 2	apprate	1.1	kg/ha	
Record 17:	FILTRA			
	IPSCND	1		
	UPTKF			
Record 18:	PLVKRT			
	PLDKRT			
	FEXTRC	0.5		
Flag for Index Res. Run	IR	Reservoir		

Flag for runoff calc. RUNOFF total none, monthly or total(average of entire run)

Corn-Average Typical Rate
stored as KScorn_typical inc.out
Chemical: Chlorpyrifos
PRZM environment: KSCornStd.txt modified Monday, 25 August 2008 at 15:45:08
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w13996.dvf modified Wedday, 3 July 2002 at 10:04:44
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	2.793	2.426	1.683	1.114	1.008	0.4371
1962	3.323	2.838	1.827	1.207	1.049	0.4989
1963	2.34	2.071	1.42	0.8743	0.7997	0.3366
1964	2.417	2.087	1.633	0.9547	0.8954	0.4307
1965	2.061	1.879	1.42	1.199	0.9656	0.4853
1966	3.593	3.17	2.057	1.185	0.9574	0.3781
1967	5.777	5.167	3.861	2.53	2.083	0.8483
1968	2.984	2.595	2.182	1.388	1.182	0.6019
1969	2.571	2.243	1.979	1.54	1.319	0.5596
1970	2.176	1.907	1.541	1.046	0.8258	0.3877
1971	1.822	1.625	1.198	0.8064	0.6524	0.3079
1972	2.632	2.279	1.427	0.8246	0.7391	0.3989
1973	3.491	3.037	1.999	1.414	1.436	0.8224
1974	1.85	1.632	1.072	0.7658	0.6697	0.447
1975	1.685	1.546	1.047	0.6962	0.5451	0.2998
1976	1.145	1.011	0.7145	0.5134	0.4436	0.2084
1977	4.889	4.277	2.981	2.545	2.11	0.8596
1978	3.576	3.26	2.142	1.42	1.178	0.5946
1979	1.98	1.726	1.419	0.9305	0.8676	0.4648
1980	2.535	2.2	1.509	0.83	0.7397	0.419
1981	3.91	3.394	2.162	1.761	1.626	0.7074
1982	4.409	3.883	3.012	2.128	1.846	0.7502
1983	1.175	1.084	0.7382	0.6624	0.5956	0.329
1984	4.249	3.662	2.571	1.6	1.257	0.4919
1985	1.885	1.727	1.206	0.8493	0.8449	0.5144
1986	3.765	3.388	2.768	1.692	1.387	0.6298
1987	1.522	1.338	1.053	0.8784	0.7878	0.4149
1988	1.355	1.222	0.8626	0.5495	0.4809	0.2349
1989	3.317	2.869	1.902	1.22	1.127	0.618
1990	2.851	2.477	1.553	1.119	0.9974	0.5128

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.032258064516129	5.777	5.167	3.861	2.545	2.11	0.8596
0.0645161290322581	4.889	4.277	3.012	2.53	2.083	0.8483
0.0967741935483871	4.409	3.883	2.981	2.128	1.846	0.8224
0.129032258064516	4.249	3.662	2.768	1.761	1.626	0.7502
0.161290322580645	3.91	3.394	2.571	1.692	1.436	0.7074
0.193548387096774	3.765	3.388	2.182	1.6	1.387	0.6298
0.225806451612903	3.593	3.26	2.162	1.54	1.319	0.618
0.258064516129032	3.576	3.17	2.142	1.42	1.257	0.6019
0.290322580645161	3.491	3.037	2.057	1.414	1.182	0.5946
0.32258064516129	3.323	2.869	1.999	1.388	1.178	0.5596
0.354838709677419	3.317	2.838	1.979	1.22	1.127	0.5144
0.387096774193548	2.984	2.595	1.902	1.207	1.049	0.5128

0.419354838709677	2.851	2.477	1.827	1.199	1.008	0.4989
0.451612903225806	2.793	2.426	1.683	1.185	0.9974	0.4919
0.483870967741936	2.632	2.279	1.633	1.119	0.9656	0.4853
0.516129032258065	2.571	2.243	1.553	1.114	0.9574	0.4648
0.548387096774194	2.535	2.2	1.541	1.046	0.8954	0.447
0.580645161290323	2.417	2.087	1.509	0.9547	0.8676	0.4371
0.612903225806452	2.34	2.071	1.427	0.9305	0.8449	0.4307
0.645161290322581	2.176	1.907	1.42	0.8784	0.8258	0.419
0.67741935483871	2.061	1.879	1.42	0.8743	0.7997	0.4149
0.709677419354839	1.98	1.727	1.419	0.8493	0.7878	0.3989
0.741935483870968	1.885	1.726	1.206	0.83	0.7397	0.3877
0.774193548387097	1.85	1.632	1.198	0.8246	0.7391	0.3781
0.806451612903226	1.822	1.625	1.072	0.8064	0.6697	0.3366
0.838709677419355	1.685	1.546	1.053	0.7658	0.6524	0.329
0.870967741935484	1.522	1.338	1.047	0.6962	0.5956	0.3079
0.903225806451613	1.355	1.222	0.8626	0.6624	0.5451	0.2998
0.935483870967742	1.175	1.084	0.7382	0.5495	0.4809	0.2349
0.967741935483871	1.145	1.011	0.7145	0.5134	0.4436	0.2084

0.1	4.393	3.8609	2.9597	2.0913	1.824	0.81518

Average of yearly averages: 0.499663333333333

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: KScorn_typical inc
Metfile: w13996.dvf
PRZM scenario: KSCornStd.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd	Kd		mg/L	
Koc	Koc	6040	mg/L	
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	4	integer	See PRZM manual	
Incorporation Depth:	DEPI	4	cm	
Application Rate:	TAPP	0.99	kg/ha	
Application Efficiency:	APPEFF	1.0	fraction	
Spray Drift	DRFT	0	fraction of application rate applied to pond	
Application Date	Date	1-5	dd/mm or dd/mmm or dd-mm or dd-mmm	
Record 17:	FILTRA			
	IPSCND	1		
	UPTKF			
Record 18:	PLVKRT			
	PLDKRT			
	FEXTRC	0.5		
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)	

NC Cotton
stored as NCCotton_aerial.out
Chemical: Chlorpyrifos
PRZM environment: NCcottonSTD.txt modified Tueday, 29 May 2007 at 13:58:38
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w13722.dvf modified Wedday, 3 July 2002 at 10:05:50
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	14.04	12.46	9.297	6.386	6.508	2.572
1962	31.65	27.82	20.73	16.96	14.06	5.908
1963	27.78	25.06	18.05	11.95	9.641	4.605
1964	15.93	14.01	9.158	7.707	7.597	4.378
1965	55.07	49.08	38.1	24.34	19.83	7.509
1966	31.44	27.71	19.07	13.12	11.92	5.557
1967	43.45	38	26.69	16.62	13.85	5.832
1968	29.1	25.5	18.07	13.94	11.83	5.292
1969	28.62	25.32	17.91	13.78	12.79	5.862
1970	18.05	15.83	12.48	9.606	7.842	3.994
1971	26.03	22.86	15.64	13.03	11.83	5.61
1972	36.96	32.52	22.43	16.39	13.68	6.327
1973	43.59	39.2	31.33	20.12	17.21	7.091
1974	20.74	18.29	13.82	9.841	9.522	4.884
1975	30.24	27.37	19.47	14.9	13.3	5.949
1976	20.24	17.98	14.51	10.72	8.476	4.735
1977	29.92	26.98	18.18	10.65	9.156	5.231
1978	26.35	23.19	16.36	13.49	11.09	5.034
1979	16.81	15.14	12.36	10.37	9.327	5.043
1980	36.6	32.05	20.76	12.41	10.86	5.084
1981	27.48	24.67	17.64	12.36	11.35	5.404
1982	48.52	42.95	31.9	21.59	17.28	6.797
1983	22.18	19.65	17.41	12.56	9.96	4.589
1984	43.7	38.73	25.36	18.67	16.09	6.456
1985	17.42	15.72	12.71	10.67	9.463	4.834
1986	21.43	18.99	14.33	10.72	9.368	4.954
1987	15.76	13.89	12.3	7.943	6.559	4.094
1988	13.19	11.91	9.661	6.708	5.942	3.944
1989	40.18	35.98	24.8	16.01	13.32	5.552
1990	36.13	31.53	20.82	12.14	9.605	4.195

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.032258064516129			55.07	49.08	38.1	24.34	19.83	7.509
0.0645161290322581			48.52	42.95	31.9	21.59	17.28	7.091
0.0967741935483871			43.7	39.2	31.33	20.12	17.21	6.797
0.129032258064516			43.59	38.73	26.69	18.67	16.09	6.456
0.161290322580645			43.45	38	25.36	16.96	14.06	6.327
0.193548387096774			40.18	35.98	24.8	16.62	13.85	5.949
0.225806451612903			36.96	32.52	22.43	16.39	13.68	5.908
0.258064516129032			36.6	32.05	20.82	16.01	13.32	5.862
0.290322580645161			36.13	31.53	20.76	14.9	13.3	5.832
0.32258064516129			31.65	27.82	20.73	13.94	12.79	5.61
0.354838709677419			31.44	27.71	19.47	13.78	11.92	5.557
0.387096774193548			30.24	27.37	19.07	13.49	11.83	5.552
0.419354838709677			29.92	26.98	18.18	13.12	11.83	5.404
0.451612903225806			29.1	25.5	18.07	13.03	11.35	5.292

0.483870967741936		28.62	25.32	18.05	12.56	11.09	5.231
0.516129032258065		27.78	25.06	17.91	12.41	10.86	5.084
0.548387096774194		27.48	24.67	17.64	12.36	9.96	5.043
0.580645161290323		26.35	23.19	17.41	12.14	9.641	5.034
0.612903225806452		26.03	22.86	16.36	11.95	9.605	4.954
0.645161290322581		22.18	19.65	15.64	10.72	9.522	4.884
0.67741935483871		21.43	18.99	14.51	10.72	9.463	4.834
0.709677419354839		20.74	18.29	14.33	10.67	9.368	4.735
0.741935483870968		20.24	17.98	13.82	10.65	9.327	4.605
0.774193548387097		18.05	15.83	12.71	10.37	9.156	4.589
0.806451612903226		17.42	15.72	12.48	9.841	8.476	4.378
0.838709677419355		16.81	15.14	12.36	9.606	7.842	4.195
0.870967741935484		15.93	14.01	12.3	7.943	7.597	4.094
0.903225806451613		15.76	13.89	9.661	7.707	6.559	3.994
0.935483870967742		14.04	12.46	9.297	6.708	6.508	3.944
0.967741935483871		13.19	11.91	9.158	6.386	5.942	2.572

0.1	43.689	39.153	30.866	19.975	17.098	6.7629

Average of yearly averages: 5.24386666666667

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: NCCotton_aerial
Metfile: w13722.dvf
PRZM scenario: NCcottonSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd Kd		mg/L		
Koc Koc	6040	mg/L		
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	2	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	1.1	kg/ha	
Application Efficiency:	APPEFF	0.95	fraction	
Spray Drift	DRFT	0.039	fraction of application rate applied to pond	
Application Date	Date	15-05	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	10	days	Set to 0 or delete line for single app.
app. rate 1	apprate	1.1	kg/ha	
Interval 2	interval	10	days	Set to 0 or delete line for single app.
app. rate 2	apprate	1.1	kg/ha	
Record 17:	FILTRA			
IPSCND	1			
UPTKF				
Record 18:	PLVKRT			
PLDKRT				
FEXTRC	0.5			

Flag for Index Res. Run IR Reservoir
Flag for runoff calc. RUNOFF total none, monthly or total(average of entire run)

NY Grape (drench; high rate; July application)
stored as NYGrape_drench 7_15.out
Chemical: Chlorpyrifos
PRZM environment: NYGrapesSTD.txt modified Tueday, 29 May 2007 at 13:59:44
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w14860.dvf modified Wedday, 3 July 2002 at 10:06:14
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	50.86	44.34	30.55	23.06	21.15	8.824
1962	563	492	331	198	162	60.3
1963	128	114	89.23	68.73	56.76	44.26
1964	628	545	340	193	153	60.22
1965	143	126	82.5	60.51	58.93	40.95
1966	354	309	197	116	93.85	46.55
1967	134	119	81.12	67.88	63.7	37.71
1968	108	94.95	61.62	49.81	41.95	28.15
1969	47.06	44.44	37.41	31.67	29	18.28
1970	686	595	408	244	205	73.23
1971	353	309	199	129	110	62.13
1972	94.15	84.79	64.92	51.64	47.23	35.94
1973	211	185	118	70.4	57.73	30.27
1974	250	218	143	88.68	72.63	35.94
1975	405	359	259	210	178	76.92
1976	103	92.15	80.46	63.39	57.41	43.94
1977	584	512	382	252	205	78.09
1978	524	459	312	201	165	82.16
1979	585	511	325	243	205	89.98
1980	628	551	361	231	187	88.79
1981	289	253	192	139	122	66.7
1982	342	300	195	127	106	55.65
1983	522	459	356	225	187	76.13
1984	391	342	222	132	107	54.16
1985	183	161	113	86.6	69.56	39.08
1986	409	355	243	142	116	50.15
1987	532	462	295	228	189	81.08
1988	372	325	207	151	130	68.17
1989	235	205	132	97.32	81.73	45.55
1990	419	369	268	194	158	62.18

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.032258064516129		686	595	408	252	205	89.98
0.0645161290322581		628	551	382	244	205	88.79
0.0967741935483871		628	545	361	243	205	82.16
0.129032258064516		585	512	356	231	189	81.08
0.161290322580645		584	511	340	228	187	78.09
0.193548387096774		563	492	331	225	187	76.92
0.225806451612903		532	462	325	210	178	76.13
0.258064516129032		524	459	312	201	165	73.23
0.290322580645161		522	459	295	198	162	68.17
0.32258064516129		419	369	268	194	158	66.7
0.354838709677419		409	359	259	193	153	62.18

0.387096774193548	405	355	243	151	130	62.13
0.419354838709677	391	342	222	142	122	60.3
0.451612903225806	372	325	207	139	116	60.22
0.483870967741936	354	309	199	132	110	55.65
0.516129032258065	353	309	197	129	107	54.16
0.548387096774194	342	300	195	127	106	50.15
0.580645161290323	289	253	192	116	93.85	46.55
0.612903225806452	250	218	143	97.32	81.73	45.55
0.645161290322581	235	205	132	88.68	72.63	44.26
0.67741935483871	211	185	118	86.6	69.56	43.94
0.709677419354839	183	161	113	70.4	63.7	40.95
0.741935483870968	143	126	89.23	68.73	58.93	39.08
0.774193548387097	134	119	82.5	67.88	57.73	37.71
0.806451612903226	128	114	81.12	63.39	57.41	35.94
0.838709677419355	108	94.95	80.46	60.51	56.76	35.94
0.870967741935484	103	92.15	64.92	51.64	47.23	30.27
0.903225806451613	94.15	84.79	61.62	49.81	41.95	28.15
0.935483870967742	50.86	44.44	37.41	31.67	29	18.28
0.967741935483871	47.06	44.34	30.55	23.06	21.15	8.824

0.1	623.7	541.7	360.5	241.8	203.4	82.052

Average of yearly averages: 54.7161333333333

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: NYGrape_drench 7_15
Metfile: w14860.dvf
PRZM scenario: NYGrapesSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd	Kd		mg/L	
Koc	Koc	6040	mg/L	
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	1	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	37.3	kg/ha	
Application Efficiency:	APPEFF	0.99	fraction	
Spray Drift	DRFT	0.01	fraction of application rate applied to pond	
Application Date	Date	15-7	dd/mm or dd/mmm or dd-mm or dd-mmm	
Record 17:	FILTRA			
	IPSCND	1		
	UPTKF			
Record 18:	PLVKRT			
	PLDKRT			
	FEXTRC	0.5		
Flag for Index Res. Run	IR	Reservoir		

Flag for runoff calc. RUNOFF total none, monthly or total(average of entire run)

NY Grape (drench; high rate; May application)
stored as NYGrape_drench 5_15.out
Chemical: Chlorpyrifos
PRZM environment: NYGrapesSTD.txt modified Tueday, 29 May 2007 at 13:59:44
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w14860.dvf modified Wedday, 3 July 2002 at 10:06:14
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	96.35	83.86	52.87	32.3	27.08	11.31
1962	369	349	241	145	132	51.23
1963	70.1	62.44	48.02	37.74	31.65	25.42
1964	400	347	219	140	132	55.36
1965	350	306	199	138	129	58.71
1966	199	176	141	86.97	85.94	42.27
1967	398	349	230	139	115	49.49
1968	54.69	48.63	33.44	32.49	30.02	21.73
1969	183	160	114	80.64	67.8	30.09
1970	366	319	202	147	132	55.27
1971	174	154	102	67.55	58.25	34.89
1972	447	391	269	220	180	71.39
1973	495	433	320	198	158	65.86
1974	376	332	219	148	123	53.74
1975	326	285	184	125	114	57.97
1976	446	389	250	170	145	62.9
1977	288	253	168	132	111	55.15
1978	255	224	154	101	83.5	45.82
1979	485	427	284	179	158	71.85
1980	426	374	283	196	168	73.34
1981	165	145	95.85	82	72.74	42.28
1982	1070	932	613	360	284	103
1983	345	303	195	154	126	58.92
1984	300	263	174	105	90.18	47.53
1985	258	226	149	123	104	47.8
1986	773	692	458	287	225	84.84
1987	180	160	116	98.86	87.01	47.02
1988	224	196	127	77.28	77.95	44.34
1989	280	250	172	134	110	50.15
1990	219	192	125	86.28	71.52	44.4

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.032258064516129	1070	932	613	360	284	103
0.0645161290322581	773	692	458	287	225	84.84
0.0967741935483871	495	433	320	220	180	73.34
0.129032258064516	485	427	284	198	168	71.85
0.161290322580645	447	391	283	196	158	71.39
0.193548387096774	446	389	269	179	158	65.86
0.225806451612903	426	374	250	170	145	62.9
0.258064516129032	400	349	241	154	132	58.92
0.290322580645161	398	349	230	148	132	58.71
0.32258064516129	376	347	219	147	132	57.97
0.354838709677419	369	332	219	145	129	55.36
0.387096774193548	366	319	202	140	126	55.27

0.419354838709677	350	306	199	139	123	55.15
0.451612903225806	345	303	195	138	115	53.74
0.483870967741936	326	285	184	134	114	51.23
0.516129032258065	300	263	174	132	111	50.15
0.548387096774194	288	253	172	125	110	49.49
0.580645161290323	280	250	168	123	104	47.8
0.612903225806452	258	226	154	105	90.18	47.53
0.645161290322581	255	224	149	101	87.01	47.02
0.67741935483871	224	196	141	98.86	85.94	45.82
0.709677419354839	219	192	127	86.97	83.5	44.4
0.741935483870968	199	176	125	86.28	77.95	44.34
0.774193548387097	183	160	116	82	72.74	42.28
0.806451612903226	180	160	114	80.64	71.52	42.27
0.838709677419355	174	154	102	77.28	67.8	34.89
0.870967741935484	165	145	95.85	67.55	58.25	30.09
0.903225806451613	96.35	83.86	52.87	37.74	31.65	25.42
0.935483870967742	70.1	62.44	48.02	32.49	30.02	21.73
0.967741935483871	54.69	48.63	33.44	32.3	27.08	11.31

0.1	494	432.4	316.4	217.8	178.8	73.191	
					Average of yearly averages:		52.1356666666667

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: NYGrape_drench 5_15
Metfile: w14860.dvf
PRZM scenario: NYGrapesSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd	Kd		mg/L	
Koc	Koc	6040	mg/L	
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	1	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	37.3	kg/ha	
Application Efficiency:	APPEFF	0.99	fraction	
Spray Drift	DRFT	0.01	fraction of application rate applied to pond	
Application Date	Date	15-5	dd/mm or dd/mmm or dd-mm or dd-mmm	
Record 17:	FILTRA			
	IPSCND	1		
	UPTKF			
Record 18:	PLVKRT			
	PLDKRT			
	FEXTRC	0.5		
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)	

NY Grape(low rate)
stored as NYGrape_drench 6lbs july.out
Chemical: Chlorpyrifos
PRZM environment: NYGrapesSTD.txt modified Tueday, 29 May 2007 at 13:59:44
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w14860.dvf modified Wedday, 3 July 2002 at 10:06:14
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	9.134	7.964	5.487	4.141	3.798	1.585
1962	101	88.34	59.41	35.51	29.02	10.83
1963	23.06	20.5	16.03	12.35	10.2	7.951
1964	113	97.84	61.12	34.66	27.47	10.82
1965	25.76	22.62	14.82	10.87	10.59	7.355
1966	63.53	55.45	35.4	20.8	16.86	8.362
1967	24.15	21.33	14.57	12.19	11.44	6.773
1968	19.45	17.06	11.07	8.947	7.535	5.057
1969	8.453	7.982	6.719	5.688	5.209	3.283
1970	123	107	73.35	43.83	36.86	13.15
1971	63.37	55.42	35.74	23.13	19.75	11.16
1972	16.91	15.23	11.66	9.275	8.484	6.456
1973	37.94	33.15	21.21	12.64	10.37	5.437
1974	44.84	39.19	25.75	15.93	13.05	6.455
1975	72.82	64.54	46.51	37.65	31.96	13.82
1976	18.56	16.55	14.45	11.39	10.31	7.892
1977	105	91.94	68.6	45.28	36.85	14.03
1978	94.23	82.47	56.06	36.08	29.69	14.76
1979	105	91.76	58.29	43.67	36.76	16.16
1980	113	98.96	64.92	41.42	33.5	15.95
1981	51.84	45.42	34.5	25.01	21.84	11.98
1982	61.47	53.92	35.02	22.75	19.07	9.995
1983	93.84	82.42	64.03	40.4	33.55	13.67
1984	70.3	61.42	39.82	23.77	19.2	9.729
1985	32.83	28.91	20.38	15.56	12.49	7.019
1986	73.52	63.73	43.66	25.48	20.8	9.009
1987	95.46	83	52.92	40.97	33.88	14.56
1988	66.78	58.36	37.25	27.2	23.37	12.25
1989	42.24	36.91	23.7	17.48	14.68	8.183
1990	75.24	66.32	48.21	34.88	28.37	11.17

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly		
0.032258064516129			123	107	73.35	45.28	36.86	16.16
0.0645161290322581			113	98.96	68.6	43.83	36.85	15.95
0.0967741935483871			113	97.84	64.92	43.67	36.76	14.76
0.129032258064516			105	91.94	64.03	41.42	33.88	14.56
0.161290322580645			105	91.76	61.12	40.97	33.55	14.03
0.193548387096774			101	88.34	59.41	40.4	33.5	13.82
0.225806451612903			95.46	83	58.29	37.65	31.96	13.67
0.258064516129032			94.23	82.47	56.06	36.08	29.69	13.15
0.290322580645161			93.84	82.42	52.92	35.51	29.02	12.25
0.32258064516129			75.24	66.32	48.21	34.88	28.37	11.98
0.354838709677419			73.52	64.54	46.51	34.66	27.47	11.17
0.387096774193548			72.82	63.73	43.66	27.2	23.37	11.16
0.419354838709677			70.3	61.42	39.82	25.48	21.84	10.83

0.451612903225806	66.78	58.36	37.25	25.01	20.8	10.82
0.483870967741936	63.53	55.45	35.74	23.77	19.75	9.995
0.516129032258065	63.37	55.42	35.4	23.13	19.2	9.729
0.548387096774194	61.47	53.92	35.02	22.75	19.07	9.009
0.580645161290323	51.84	45.42	34.5	20.8	16.86	8.362
0.612903225806452	44.84	39.19	25.75	17.48	14.68	8.183
0.645161290322581	42.24	36.91	23.7	15.93	13.05	7.951
0.67741935483871	37.94	33.15	21.21	15.56	12.49	7.892
0.709677419354839	32.83	28.91	20.38	12.64	11.44	7.355
0.741935483870968	25.76	22.62	16.03	12.35	10.59	7.019
0.774193548387097	24.15	21.33	14.82	12.19	10.37	6.773
0.806451612903226	23.06	20.5	14.57	11.39	10.31	6.456
0.838709677419355	19.45	17.06	14.45	10.87	10.2	6.455
0.870967741935484	18.56	16.55	11.66	9.275	8.484	5.437
0.903225806451613	16.91	15.23	11.07	8.947	7.535	5.057
0.935483870967742	9.134	7.982	6.719	5.688	5.209	3.283
0.967741935483871	8.453	7.964	5.487	4.141	3.798	1.585

0.1	112.2	97.25	64.831	43.445	36.472	14.74	
					Average of yearly averages:		9.82836666666667

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: NYGrape_drench 6lbs july
Metfile: w14860.dvf
PRZM scenario: NYGrapesSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd Kd		mg/L		
Koc Koc	6040	mg/L		
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis: pH 7	81	days	Half-life	
Method: CAM 1	integer	See PRZM manual		
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	6.7	kg/ha	
Application Efficiency:	APPEFF	0.99	fraction	
Spray Drift	DRFT	0.01	fraction of application rate applied to pond	
Application Date	Date	15-7	dd/mm or dd/mmm or dd-mm or dd-mmm	
Record 17:	FILTRA			
IPSCND	1			
UPTKF				
Record 18:	PLVKRT			
PLDKRT				
FEXTRC	0.5			
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)	

Grape Average Typical Rate (CA)
stored as CAGrape_typical_1_28-02.out
Chemical: Chlorpyrifos
PRZM environment: CAgrapes_WirrigSTD.txt modified Tueday, 29 May 2007 at 13:42:54
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w93193.dvf modified Wedday, 3 July 2002 at 10:04:24
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	0.9586	0.8541	0.5497	0.2907	0.2174	0.1406
1962	1.241	1.089	0.699	0.5212	0.4129	0.2139
1963	1.246	1.094	0.7627	0.6028	0.5255	0.279
1964	0.9844	0.8589	0.5761	0.3183	0.2426	0.182
1965	4.286	3.717	2.286	1.267	0.9883	0.4044
1966	1.295	1.128	0.7203	0.3198	0.2377	0.201
1967	1.745	1.572	1.018	0.6733	0.6219	0.3099
1968	0.9803	0.8537	0.5749	0.3717	0.2954	0.2186
1969	2.944	2.572	1.741	1.307	1.163	0.5037
1970	2.944	2.586	1.654	0.9195	0.7914	0.387
1971	1.015	0.9215	0.6161	0.4117	0.3623	0.2202
1972	1.022	0.8985	0.6039	0.3334	0.2467	0.2008
1973	1.083	0.9479	0.6269	0.4676	0.3866	0.2166
1974	0.9866	0.8592	0.5613	0.3218	0.2791	0.1934
1975	0.9673	0.8372	0.5453	0.2947	0.2259	0.1494
1976	2.146	1.864	1.149	0.6341	0.5037	0.3059
1977	1.068	0.9233	0.6053	0.3667	0.2985	0.2108
1978	2.406	2.097	1.373	1.094	0.8974	0.434
1979	0.997	0.8685	0.578	0.3096	0.2406	0.1614
1980	1.563	1.364	1.03	0.6365	0.5221	0.2625
1981	1.03	0.8981	0.6069	0.4421	0.3892	0.211
1982	1.086	1.007	0.7713	0.6146	0.4881	0.3269
1983	2.333	2.049	1.377	1.054	0.929	0.5125
1984	0.9792	0.8786	0.5941	0.3201	0.246	0.1739
1985	0.9656	0.877	0.5561	0.3072	0.2337	0.1652
1986	1.952	1.706	1.22	0.7758	0.614	0.3114
1987	1.08	0.9514	0.6315	0.3812	0.4048	0.2347
1988	1.143	1.018	0.6397	0.4644	0.4103	0.2119
1989	0.9885	0.8979	0.6221	0.3799	0.3072	0.196
1990	1.025	0.8979	0.6151	0.3668	0.3523	0.2322

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.032258064516129	4.286	3.717	2.286	1.307	1.163	0.5125	
0.0645161290322581	2.944	2.586	1.741	1.267	0.9883	0.5037	
0.0967741935483871	2.944	2.572	1.654	1.094	0.929	0.434	
0.129032258064516	2.406	2.097	1.377	1.054	0.8974	0.4044	
0.161290322580645	2.333	2.049	1.373	0.9195	0.7914	0.387	
0.193548387096774	2.146	1.864	1.22	0.7758	0.6219	0.3269	
0.225806451612903	1.952	1.706	1.149	0.6733	0.614	0.3114	
0.258064516129032	1.745	1.572	1.03	0.6365	0.5255	0.3099	
0.290322580645161	1.563	1.364	1.018	0.6341	0.5221	0.3059	
0.32258064516129	1.295	1.128	0.7713	0.6146	0.5037	0.279	
0.354838709677419	1.246	1.094	0.7627	0.6028	0.4881	0.2625	
0.387096774193548	1.241	1.089	0.7203	0.5212	0.4129	0.2347	
0.419354838709677	1.143	1.018	0.699	0.4676	0.4103	0.2322	
0.451612903225806	1.086	1.007	0.6397	0.4644	0.4048	0.2202	

0.483870967741936	1.083	0.9514	0.6315	0.4421	0.3892	0.2186
0.516129032258065	1.08	0.9479	0.6269	0.4117	0.3866	0.2166
0.548387096774194	1.068	0.9233	0.6221	0.3812	0.3623	0.2139
0.580645161290323	1.03	0.9215	0.6161	0.3799	0.3523	0.2119
0.612903225806452	1.025	0.8985	0.6151	0.3717	0.3072	0.211
0.645161290322581	1.022	0.8981	0.6069	0.3668	0.2985	0.2108
0.67741935483871	1.015	0.8979	0.6053	0.3667	0.2954	0.201
0.709677419354839	0.997	0.8979	0.6039	0.3334	0.2791	0.2008
0.741935483870968	0.9885	0.8786	0.5941	0.3218	0.2467	0.196
0.774193548387097	0.9866	0.877	0.578	0.3201	0.246	0.1934
0.806451612903226	0.9844	0.8685	0.5761	0.3198	0.2426	0.182
0.838709677419355	0.9803	0.8592	0.5749	0.3183	0.2406	0.1739
0.870967741935484	0.9792	0.8589	0.5613	0.3096	0.2377	0.1652
0.903225806451613	0.9673	0.8541	0.5561	0.3072	0.2337	0.1614
0.935483870967742	0.9656	0.8537	0.5497	0.2947	0.2259	0.1494
0.967741935483871	0.9586	0.8372	0.5453	0.2907	0.2174	0.1406

0.1	2.8902	2.5245	1.6263	1.09	0.92584	0.43104

Average of yearly averages: 0.259026666666667

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: CAGrape_typical_1_28-02
Metfile: w93193.dvf
PRZM scenario: CAgrapes_WirrigSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd Kd		mg/L		
Koc Koc	6040	mg/L		
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis: pH 7	81	days	Half-life	
Method: CAM 1	integer	See PRZM manual		
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	2.5	kg/ha	
Application Efficiency:	APPEFF	0.99	fraction	
Spray Drift	DRFT	0.01	fraction of application rate applied to pond	
Application Date	Date	28-02	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	150	days	Set to 0 or delete line for single app.
app. rate 1	apprate	2.5	kg/ha	
Record 17:	FILTRA			
IPSCND	1			
UPTKF				
Record 18:	PLVKRT			
PLDKRT				
FEXTRC	0.5			
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)	

OR Mint
stored as OR Mint.out
Chemical: Chlorpyrifos
PRZM environment: ORmintSTD.txt modified Tueday, 29 May 2007 at 14:00:46
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w24232.dvf modified Wedday, 3 July 2002 at 10:06:10
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	6.982	6.053	3.352	1.978	1.473	0.4413
1962	12.25	10.6	6.999	4.194	3.438	1.59
1963	6.782	6.046	4.305	3.315	2.864	2.228
1964	17.68	16.1	8.556	5.005	3.526	2.038
1965	10.57	9.624	5.981	5.112	4.258	2.546
1966	11.4	10.41	7.375	4.949	3.964	2.516
1967	8.382	7.653	5.213	3.951	2.998	1.991
1968	11.35	10.1	7.844	5.295	4.504	2.762
1969	13.33	11.7	7.927	6.509	5.118	2.948
1970	9.936	8.003	6.59	5.661	4.927	2.914
1971	8.717	7.717	5.86	4.011	3.48	2.511
1972	10.8	9.475	6.182	4.183	3.585	2.167
1973	21.48	18.77	13.38	9.208	6.388	2.732
1974	12.08	11.19	8.118	5.935	5.144	3.229
1975	8.365	7.361	5.092	4.185	3.184	2.117
1976	4.253	3.898	3.279	2.725	2.581	1.369
1977	11.94	10.66	7.622	5.147	3.689	1.234
1978	6.895	6.047	4.544	3.389	2.911	1.961
1979	6.719	6.044	4.564	3.474	3.048	1.868
1980	16.97	14.84	9.699	6.632	4.624	2.446
1981	14.18	12.42	9.301	7.24	5.953	3.398
1982	8.565	7.701	6.409	4.356	3.914	2.55
1983	7.686	6.761	5.427	4.213	3.519	2.435
1984	15.59	13.58	9.84	7.149	5.161	2.442
1985	6.87	6.086	4.016	2.952	2.708	1.953
1986	7.974	7.011	5.21	3.048	2.272	1.475
1987	18.12	16.07	12.75	5.977	4.171	2.141
1988	9.977	8.886	6.007	4.26	3.652	2.248
1989	15.55	13.59	8.574	4.527	3.331	1.759
1990	9.156	7.983	5.669	4.412	3.66	2.363

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.032258064516129			21.48	18.77	13.38	9.208	6.388	3.398
0.0645161290322581			18.12	16.1	12.75	7.24	5.953	3.229
0.0967741935483871			17.68	16.07	9.84	7.149	5.161	2.948
0.129032258064516			16.97	14.84	9.699	6.632	5.144	2.914
0.161290322580645			15.59	13.59	9.301	6.509	5.118	2.762
0.193548387096774			15.55	13.58	8.574	5.977	4.927	2.732
0.225806451612903			14.18	12.42	8.556	5.935	4.624	2.55
0.258064516129032			13.33	11.7	8.118	5.661	4.504	2.546
0.290322580645161			12.25	11.19	7.927	5.295	4.258	2.516
0.32258064516129			12.08	10.66	7.844	5.147	4.171	2.511
0.354838709677419			11.94	10.6	7.622	5.112	3.964	2.446
0.387096774193548			11.4	10.41	7.375	5.005	3.914	2.442
0.419354838709677			11.35	10.1	6.999	4.949	3.689	2.435

0.451612903225806		10.8	9.624	6.59	4.527	3.66	2.363
0.483870967741936		10.57	9.475	6.409	4.412	3.652	2.248
0.516129032258065		9.977	8.886	6.182	4.356	3.585	2.228
0.548387096774194		9.936	8.003	6.007	4.26	3.526	2.167
0.580645161290323		9.156	7.983	5.981	4.213	3.519	2.141
0.612903225806452		8.717	7.717	5.86	4.194	3.48	2.117
0.645161290322581		8.565	7.701	5.669	4.185	3.438	2.038
0.67741935483871		8.382	7.653	5.427	4.183	3.331	1.991
0.709677419354839		8.365	7.361	5.213	4.011	3.184	1.961
0.741935483870968		7.974	7.011	5.21	3.951	3.048	1.953
0.774193548387097		7.686	6.761	5.092	3.474	2.998	1.868
0.806451612903226		6.982	6.086	4.564	3.389	2.911	1.759
0.838709677419355		6.895	6.053	4.544	3.315	2.864	1.59
0.870967741935484		6.87	6.047	4.305	3.048	2.708	1.475
0.903225806451613		6.782	6.046	4.016	2.952	2.581	1.369
0.935483870967742		6.719	6.044	3.352	2.725	2.272	1.234
0.967741935483871		4.253	3.898	3.279	1.978	1.473	0.4413

0.1	17.609	15.947	9.8259	7.0973	5.1593	2.9446

Average of yearly averages: 2.21241

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: OR Mint
Metfile: w24232.dvf
PRZM scenario: ORmintSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd Kd	Kd		mg/L	
Koc Koc	6040		mg/L	
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	1	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	2.2	kg/ha	
Application Efficiency:	APPEFF	0.99	fraction	
Spray Drift	DRFT	0.01	fraction of application rate applied to pond	
Application Date	Date	30-04	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	90	days	Set to 0 or delete line for single app.
app. rate 1	apprate	2.2	kg/ha	
Interval 2	interval	90	days	Set to 0 or delete line for single app.
app. rate 2	apprate	2.2	kg/ha	

Record 17: FILTRA
IPSCND 1
UPTKF
Record 18: PLVKRT
PLDKRT

FEXTRC	0.5		
Flag for Index Res. Run	IR	Reservoir	
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)

GA Onions
stored as GA Onions_dry bulb final 4-12.out
Chemical: Chlorpyrifos
PRZM environment: GAOnion_WirrigSTD.txt modified Tueday, 29 May 2007 at 13:54:42
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w03822.dvf modified Wedday, 3 July 2002 at 10:04:32
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	1.935	1.677	1.086	0.4158	0.2772	0.06835
1962	4.162	3.737	2.545	1.772	1.761	0.9677
1963	4.142	3.759	2.592	1.742	1.481	0.9686
1964	7.932	6.9	4.755	3.319	2.824	1.79
1965	3.688	3.222	2.34	1.878	1.64	0.9506
1966	4.626	4.087	2.844	2.337	2.083	1.113
1967	9.055	8.579	6.097	3.513	2.744	1.14
1968	1.734	1.521	1.004	0.6808	0.6256	0.3931
1969	4.323	3.749	2.423	2.066	1.726	1.046
1970	3.038	2.689	2.142	1.528	1.439	0.9658
1971	3.172	2.748	1.822	1.245	1.191	0.8923
1972	2.933	2.596	1.991	1.569	1.456	0.9174
1973	3.783	3.312	2.161	1.833	1.669	0.963
1974	2.364	2.062	1.392	1.014	0.8969	0.6229
1975	2.999	2.619	1.747	1.332	1.194	0.8066
1976	4.876	4.278	2.671	1.96	1.724	1.011
1977	3.176	2.786	2.043	1.304	1.102	0.6376
1978	5.9	5.116	2.491	1.796	1.552	0.8638
1979	4.769	4.176	2.867	1.988	1.827	1.356
1980	3.502	3.118	2.269	1.599	1.386	0.6973
1981	2.75	2.298	1.597	0.9862	0.7535	0.5127
1982	5.443	4.73	3.42	2.364	1.928	1.214
1983	5.877	5.201	4.319	3.201	2.99	1.505
1984	12.58	10.99	7.402	4.957	4.102	1.735
1985	2.236	1.926	1.267	0.7713	0.733	0.4292
1986	5.997	5.274	3.773	2.279	1.791	0.93
1987	8.349	7.272	5.081	3.527	2.924	1.407
1988	3.79	3.308	2.319	1.393	1.293	0.7504
1989	5.912	5.144	4.003	1.709	1.33	0.667
1990	6.836	6.029	4.174	2.829	2.393	1.149

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.032258064516129	12.58	10.99	7.402	4.957	4.102	1.79	
0.0645161290322581	9.055	8.579	6.097	3.527	2.99	1.735	
0.0967741935483871	8.349	7.272	5.081	3.513	2.924	1.505	
0.129032258064516	7.932	6.9	4.755	3.319	2.824	1.407	
0.161290322580645	6.836	6.029	4.319	3.201	2.744	1.356	
0.193548387096774	5.997	5.274	4.174	2.829	2.393	1.214	
0.225806451612903	5.912	5.201	4.003	2.364	2.083	1.149	
0.258064516129032	5.9	5.144	3.773	2.337	1.928	1.14	
0.290322580645161	5.877	5.116	3.42	2.279	1.827	1.113	
0.32258064516129	5.443	4.73	2.867	2.066	1.791	1.046	

0.354838709677419	4.876	4.278	2.844	1.988	1.761	1.011
0.387096774193548	4.769	4.176	2.671	1.96	1.726	0.9686
0.419354838709677	4.626	4.087	2.592	1.878	1.724	0.9677
0.451612903225806	4.323	3.759	2.545	1.833	1.669	0.9658
0.483870967741936	4.162	3.749	2.491	1.796	1.64	0.963
0.516129032258065	4.142	3.737	2.423	1.772	1.552	0.9506
0.548387096774194	3.79	3.312	2.34	1.742	1.481	0.93
0.580645161290323	3.783	3.308	2.319	1.709	1.456	0.9174
0.612903225806452	3.688	3.222	2.269	1.599	1.439	0.8923
0.645161290322581	3.502	3.118	2.161	1.569	1.386	0.8638
0.67741935483871	3.176	2.786	2.142	1.528	1.33	0.8066
0.709677419354839	3.172	2.748	2.043	1.393	1.293	0.7504
0.741935483870968	3.038	2.689	1.991	1.332	1.194	0.6973
0.774193548387097	2.999	2.619	1.822	1.304	1.191	0.667
0.806451612903226	2.933	2.596	1.747	1.245	1.102	0.6376
0.838709677419355	2.75	2.298	1.597	1.014	0.8969	0.6229
0.870967741935484	2.364	2.062	1.392	0.9862	0.7535	0.5127
0.903225806451613	2.236	1.926	1.267	0.7713	0.733	0.4292
0.935483870967742	1.935	1.677	1.086	0.6808	0.6256	0.3931
0.967741935483871	1.734	1.521	1.004	0.4158	0.2772	0.06835

0.1	8.3073	7.2348	5.0484	3.4936	2.914	1.4952

Average of yearly averages: 0.949011666666667

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: GA Onions_dry bulb final 4-12
Metfile: w03822.dvf
PRZM scenario: GAOnion_WirrigSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable	Name	Value	Units	Comments
Molecular weight		mwt	350.6	g/mol	
Henry's Law Const.		henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr		1.87e-5	torr	
Solubility	sol		1.4	mg/L	
Kd	Kd			mg/L	
Koc	Koc	6040		mg/L	
Photolysis half-life		kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism		kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism		kbacs	63	days	Halfife
Aerobic Soil Metabolism		asm	109	days	Halfife
Hydrolysis:	pH 7		81	days	Half-life
Method: CAM	1		integer	See PRZM manual	
Incorporation Depth:		DEPI	0	cm	
Application Rate:		TAPP	1.1	kg/ha	
Application Efficiency:		APPEFF	0.99	fraction	
Spray Drift	DRFT		0.01	fraction of application rate applied to pond	
Application Date	Date		4-12	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval		10	days	Set to 0 or delete line for single app.
app. rate 1	apprate		1.1	kg/ha	
Record 17:	FILTRA				
	IPSCND	1			
	UPTKF				
Record 18:	PLVKRT				

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

GA Peaches
stored as GA Peaches.out
Chemical: Chlorpyrifos
PRZM environment: GAPeachesSTD.txt modified Tueday, 29 May 2007 at 13:54:56
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w03813.dvf modified Wedday, 3 July 2002 at 10:04:32
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	12.62	11.65	7.188	2.574	1.747	0.4705
1962	13.77	12	7.569	4.384	3.46	1.461
1963	15.9	13.62	10.53	6.383	4.893	1.776
1964	7.345	6.358	3.949	2.425	2.056	1.295
1965	3.505	3.108	2.104	1.433	1.215	0.5392
1966	35.51	30.52	18.14	9.273	6.955	2.134
1967	4.153	3.614	2.797	2.327	2.078	1.116
1968	3.342	2.929	2.068	1.631	1.285	0.6434
1969	3.266	2.841	1.834	0.7751	0.6297	0.4518
1970	53.58	45.9	27.43	15.44	10.78	3.065
1971	10.78	9.848	7.95	5.997	5.19	2.419
1972	13.02	11.24	7.394	3.588	2.545	1.302
1973	5.252	4.767	3.471	2.394	2	0.8091
1974	21.66	18.61	11.04	5.66	4.285	1.34
1975	11.1	9.593	6.401	4.496	3.735	1.696
1976	16.01	13.73	8.156	4.71	3.918	1.465
1977	6.219	5.497	3.354	1.798	1.405	0.864
1978	4.628	4.054	2.619	1.649	1.375	0.76
1979	18.24	15.59	9.525	5.249	4.31	1.671
1980	11.39	9.808	5.89	3.22	2.473	1.13
1981	8.165	7.45	5.01	2.781	2.164	1.375
1982	5.872	5.054	3.534	2.008	1.751	1.201
1983	15.76	13.57	8.877	4.441	3.014	1.295
1984	3.53	3.06	2.04	1.719	1.535	0.7918
1985	5.919	5.126	3.149	1.75	1.423	0.859
1986	67.83	58.32	35.04	17.96	14.25	4.176
1987	8.683	7.52	4.687	3.595	3.259	1.767
1988	17.97	16.28	11.59	7.385	5.734	1.966
1989	11.06	9.556	5.776	3.166	3.249	1.593
1990	32.44	27.87	16.61	8.589	6.163	2.089

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.032258064516129		67.83	58.32	35.04	17.96	14.25	4.176
0.0645161290322581		53.58	45.9	27.43	15.44	10.78	3.065
0.0967741935483871		35.51	30.52	18.14	9.273	6.955	2.419
0.129032258064516		32.44	27.87	16.61	8.589	6.163	2.134
0.161290322580645		21.66	18.61	11.59	7.385	5.734	2.089
0.193548387096774		18.24	16.28	11.04	6.383	5.19	1.966
0.225806451612903		17.97	15.59	10.53	5.997	4.893	1.776
0.258064516129032		16.01	13.73	9.525	5.66	4.31	1.767
0.290322580645161		15.9	13.62	8.877	5.249	4.285	1.696

0.32258064516129	15.76	13.57	8.156	4.71	3.918	1.671
0.354838709677419	13.77	12	7.95	4.496	3.735	1.593
0.387096774193548	13.02	11.65	7.569	4.441	3.46	1.465
0.419354838709677	12.62	11.24	7.394	4.384	3.259	1.461
0.451612903225806	11.39	9.848	7.188	3.595	3.249	1.375
0.483870967741936	11.1	9.808	6.401	3.588	3.014	1.34
0.516129032258065	11.06	9.593	5.89	3.22	2.545	1.302
0.548387096774194	10.78	9.556	5.776	3.166	2.473	1.295
0.580645161290323	8.683	7.52	5.01	2.781	2.164	1.295
0.612903225806452	8.165	7.45	4.687	2.574	2.078	1.201
0.645161290322581	7.345	6.358	3.949	2.425	2.056	1.13
0.67741935483871	6.219	5.497	3.534	2.394	2	1.116
0.709677419354839	5.919	5.126	3.471	2.327	1.751	0.864
0.741935483870968	5.872	5.054	3.354	2.008	1.747	0.859
0.774193548387097	5.252	4.767	3.149	1.798	1.535	0.8091
0.806451612903226	4.628	4.054	2.797	1.75	1.423	0.7918
0.838709677419355	4.153	3.614	2.619	1.719	1.405	0.76
0.870967741935484	3.53	3.108	2.104	1.649	1.375	0.6434
0.903225806451613	3.505	3.06	2.068	1.631	1.285	0.5392
0.935483870967742	3.342	2.929	2.04	1.433	1.215	0.4705
0.967741935483871	3.266	2.841	1.834	0.7751	0.6297	0.4518

0.1	35.203	30.255	17.987	9.2046	6.8758	2.3905

Average of yearly averages: 1.45069333333333

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: GA Peaches
Metfile: w03813.dvf
PRZM scenario: GAPeachesSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable	Name	Value	Units	Comments
Molecular weight		mwt	350.6	g/mol	
Henry's Law Const.		henry	6.2e-6	atm-m^3/mol	
Vapor Pressure		vapr	1.87e-5	torr	
Solubility		sol	1.4	mg/L	
Kd	Kd			mg/L	
Koc	Koc	6040		mg/L	
Photolysis half-life		kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism		kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism		kbacs	63	days	Halfife
Aerobic Soil Metabolism		asm	109	days	Halfife
Hydrolysis:		pH 7	81	days	Half-life
Method: CAM		1	integer	See PRZM manual	
Incorporation Depth:		DEPI	0	cm	
Application Rate:		TAPP	3.3	kg/ha	
Application Efficiency:		APPEFF	0.99	fraction	
Spray Drift		DRFT	0.01	fraction of application rate applied to pond	
Application Date		Date	31-08	dd/mm or dd/mmm or dd-mm or dd-mmm	
Record 17:		FILTRA			
	IPSCND	1			
	UPTKF				
Record 18:		PLVKRT			
	PLDKRT				

FEXTRC	0.5		
Flag for Index Res. Run	IR	Reservoir	
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)

NC Peanut(incorporated)
stored as NC Peanut--final 5-31 incorp.out
Chemical: Chlorpyrifos
PRZM environment: NCpeanutSTD.txt modified Tueday, 29 May 2007 at 13:58:46
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w13722.dvf modified Wedday, 3 July 2002 at 10:05:50
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	0.9114	0.7997	0.6107	0.4312	0.4143	0.1748
1962	3.598	3.137	2.218	1.86	1.5	0.6427
1963	2.271	1.963	1.192	0.6767	0.499	0.3216
1964	1.577	1.383	1.094	0.9471	0.7664	0.4611
1965	9.276	8.134	6.139	3.82	2.97	1.051
1966	4.131	3.599	2.345	1.453	1.209	0.5791
1967	8.315	7.212	4.788	2.762	2.218	0.8157
1968	1.828	1.607	1.055	0.7838	0.6814	0.4189
1969	2.899	2.525	1.644	1.114	1.03	0.5034
1970	2.485	2.156	1.453	0.9469	0.7426	0.3698
1971	1.467	1.289	1.084	0.7397	0.6621	0.3949
1972	5.001	4.349	2.807	2.012	1.645	0.6934
1973	7.689	6.736	5.187	3.058	2.381	0.9246
1974	1.234	1.086	0.7136	0.5195	0.4974	0.3543
1975	3.915	3.441	2.269	1.248	1.021	0.49
1976	1.169	1.022	0.7685	0.5272	0.4407	0.305
1977	1.672	1.454	0.9104	0.5956	0.5495	0.3142
1978	2.758	2.41	1.711	1.396	1.149	0.5233
1979	2.6	2.284	1.603	1.119	0.949	0.5246
1980	6.485	5.613	3.46	1.888	1.487	0.6048
1981	2.599	2.289	1.562	1.048	0.8837	0.466
1982	7.785	6.795	4.458	2.75	2.144	0.8188
1983	1.363	1.202	0.8801	0.5665	0.4476	0.3402
1984	2.809	2.64	1.867	1.155	0.9392	0.4597
1985	1.616	1.417	1.132	0.9233	0.8234	0.4257
1986	3.575	3.078	1.982	1.122	0.892	0.4173
1987	1.72	1.494	1.24	0.7424	0.6601	0.4092
1988	0.8861	0.7684	0.5912	0.4107	0.4181	0.2656
1989	4.674	4.088	2.65	1.587	1.335	0.5615
1990	1.004	0.8969	0.5964	0.3391	0.2723	0.2124

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.032258064516129	9.276	8.134	6.139	3.82	2.97	1.051
0.0645161290322581	8.315	7.212	5.187	3.058	2.381	0.9246
0.0967741935483871	7.785	6.795	4.788	2.762	2.218	0.8188
0.129032258064516	7.689	6.736	4.458	2.75	2.144	0.8157
0.161290322580645	6.485	5.613	3.46	2.012	1.645	0.6934
0.193548387096774	5.001	4.349	2.807	1.888	1.5	0.6427
0.225806451612903	4.674	4.088	2.65	1.86	1.487	0.6048
0.258064516129032	4.131	3.599	2.345	1.587	1.335	0.5791
0.290322580645161	3.915	3.441	2.269	1.453	1.209	0.5615
0.32258064516129	3.598	3.137	2.218	1.396	1.149	0.5246

0.354838709677419	3.575	3.078	1.982	1.248	1.03	0.5233
0.387096774193548	2.899	2.64	1.867	1.155	1.021	0.5034
0.419354838709677	2.809	2.525	1.711	1.122	0.949	0.49
0.451612903225806	2.758	2.41	1.644	1.119	0.9392	0.466
0.483870967741936	2.6	2.289	1.603	1.114	0.892	0.4611
0.516129032258065	2.599	2.284	1.562	1.048	0.8837	0.4597
0.548387096774194	2.485	2.156	1.453	0.9471	0.8234	0.4257
0.580645161290323	2.271	1.963	1.24	0.9469	0.7664	0.4189
0.612903225806452	1.828	1.607	1.192	0.9233	0.7426	0.4173
0.645161290322581	1.72	1.494	1.132	0.7838	0.6814	0.4092
0.67741935483871	1.672	1.454	1.094	0.7424	0.6621	0.3949
0.709677419354839	1.616	1.417	1.084	0.7397	0.6601	0.3698
0.741935483870968	1.577	1.383	1.055	0.6767	0.5495	0.3543
0.774193548387097	1.467	1.289	0.9104	0.5956	0.499	0.3402
0.806451612903226	1.363	1.202	0.8801	0.5665	0.4974	0.3216
0.838709677419355	1.234	1.086	0.7685	0.5272	0.4476	0.3142
0.870967741935484	1.169	1.022	0.7136	0.5195	0.4407	0.305
0.903225806451613	1.004	0.8969	0.6107	0.4312	0.4181	0.2656
0.935483870967742	0.9114	0.7997	0.5964	0.4107	0.4143	0.2124
0.967741935483871	0.8861	0.7684	0.5912	0.3391	0.2723	0.1748

0.1	7.7754	6.7891	4.755	2.7608	2.2106	0.81849

Average of yearly averages: 0.494786666666667

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: NC Peanut--final 5-31 incorp
Metfile: w13722.dvf
PRZM scenario: NCpeanutSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd Kd	Kd		mg/L	
Koc Koc	Koc	6040	mg/L	
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	4	integer	See PRZM manual	
Incorporation Depth:	DEPI	7.6	cm	
Application Rate:	TAPP	2.2	kg/ha	
Application Efficiency:	APPEFF	0.99	fraction	
Spray Drift	DRFT	0.01	fraction of application rate applied to pond	
Application Date	Date	31-5	dd/mm or dd/mmm or dd-mm or dd-mmm	
Record 17:	FILTRA			
IPSCND	1			
UPTKF				
Record 18:	PLVKRT			
PLDKRT				
FEXTRC		0.5		

Flag for Index Res. Run IR Reservoir
Flag for runoff calc. RUNOFF total none, monthly or total(average of entire run)

NC Peanut
stored as NC Peanut--aerial 5_31.out
Chemical: Chlorpyrifos
PRZM environment: NCpeanutSTD.txt modified Tueday, 29 May 2007 at 13:58:46
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w13722.dvf modified Wedday, 3 July 2002 at 10:05:50
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	7.18	6.296	4.859	3.245	3.152	1.254
1962	29.2	25.41	17.75	14.32	11.29	4.686
1963	14.86	12.86	7.845	4.485	3.327	2.266
1964	11.94	10.44	7.459	6.435	5.23	3.237
1965	64.02	56.28	42.2	26.28	20.5	7.236
1966	30.54	26.6	17.28	10.57	8.773	4.091
1967	60.48	52.48	34.77	20.05	16.03	5.839
1968	13.48	11.86	7.878	5.957	5.061	3.01
1969	12.98	11.33	7.903	5.902	5.652	2.991
1970	17.84	15.49	10.41	6.717	5.269	2.545
1971	10.69	9.408	7.847	5.274	4.661	2.716
1972	36.64	31.86	20.55	14.47	11.78	4.856
1973	54.13	47.59	36.8	21.72	16.92	6.518
1974	8.345	7.357	4.877	3.557	3.503	2.464
1975	27.87	24.55	16.22	8.962	7.292	3.399
1976	7.748	6.772	5.107	3.497	2.924	2.016
1977	11.08	9.649	6.074	3.984	3.686	2.133
1978	17.13	15.09	10.32	8.724	7.136	3.357
1979	10.95	9.686	8.15	6.391	5.508	3.274
1980	47.92	41.5	25.65	14.03	11.02	4.362
1981	19.68	17.37	11.89	7.851	6.563	3.357
1982	65.06	56.7	35.84	21	16.43	6.212
1983	8.052	7.101	5.151	3.408	2.851	2.298
1984	19.1	17.92	12.73	8.001	6.516	3.149
1985	12.66	11.07	8.627	6.758	5.962	2.963
1986	23.27	20.06	12.97	7.414	5.989	2.832
1987	12.33	10.76	8.157	4.924	4.656	2.795
1988	5.817	5.102	4.015	2.79	2.825	1.81
1989	16.86	14.78	11.68	7.608	6.716	3.077
1990	6.489	5.804	3.87	2.211	1.78	1.381

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.032258064516129		65.06	56.7	42.2	26.28	20.5	7.236
0.0645161290322581		64.02	56.28	36.8	21.72	16.92	6.518
0.0967741935483871		60.48	52.48	35.84	21	16.43	6.212
0.129032258064516		54.13	47.59	34.77	20.05	16.03	5.839
0.161290322580645		47.92	41.5	25.65	14.47	11.78	4.856
0.193548387096774		36.64	31.86	20.55	14.32	11.29	4.686
0.225806451612903		30.54	26.6	17.75	14.03	11.02	4.362
0.258064516129032		29.2	25.41	17.28	10.57	8.773	4.091
0.290322580645161		27.87	24.55	16.22	8.962	7.292	3.399
0.32258064516129		23.27	20.06	12.97	8.724	7.136	3.357
0.354838709677419		19.68	17.92	12.73	8.001	6.716	3.357

0.387096774193548	19.1	17.37	11.89	7.851	6.563	3.274
0.419354838709677	17.84	15.49	11.68	7.608	6.516	3.237
0.451612903225806	17.13	15.09	10.41	7.414	5.989	3.149
0.483870967741936	16.86	14.78	10.32	6.758	5.962	3.077
0.516129032258065	14.86	12.86	8.627	6.717	5.652	3.01
0.548387096774194	13.48	11.86	8.157	6.435	5.508	2.991
0.580645161290323	12.98	11.33	8.15	6.391	5.269	2.963
0.612903225806452	12.66	11.07	7.903	5.957	5.23	2.832
0.645161290322581	12.33	10.76	7.878	5.902	5.061	2.795
0.67741935483871	11.94	10.44	7.847	5.274	4.661	2.716
0.709677419354839	11.08	9.686	7.845	4.924	4.656	2.545
0.741935483870968	10.95	9.649	7.459	4.485	3.686	2.464
0.774193548387097	10.69	9.408	6.074	3.984	3.503	2.298
0.806451612903226	8.345	7.357	5.151	3.557	3.327	2.266
0.838709677419355	8.052	7.101	5.107	3.497	3.152	2.133
0.870967741935484	7.748	6.772	4.877	3.408	2.924	2.016
0.903225806451613	7.18	6.296	4.859	3.245	2.851	1.81
0.935483870967742	6.489	5.804	4.015	2.79	2.825	1.381
0.967741935483871	5.817	5.102	3.87	2.211	1.78	1.254

0.1	59.845	51.991	35.733	20.905	16.39	6.1747

Average of yearly averages: 3.40413333333333

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: NC Peanut--aerial 5_31
Metfile: w13722.dvf
PRZM scenario: NCpeanutSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd Kd	Kd		mg/L	
Koc Koc	6040		mg/L	
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	1	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	2.2	kg/ha	
Application Efficiency:	APPEFF	0.95	fraction	
Spray Drift	DRFT	0.039	fraction of application rate applied to pond	
Application Date	Date	31-05	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	10	days	Set to 0 or delete line for single app.
app. rate 1	apprate	2.2	kg/ha	
Record 17:	FILTRA			
IPSCND	1			
UPTKF				
Record 18:	PLVKRT			
PLDKRT				

FEXTRC	0.5		
Flag for Index Res. Run	IR	Reservoir	
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)

GA Pecans
stored as GAPecans_foliar and floor.out
Chemical: Chlorpyrifos
PRZM environment: GAPecansSTD.txt modified Tueday, 29 May 2007 at 13:55:08
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w93805.dvf modified Wedday, 3 July 2002 at 10:04:32
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	35.47	30.53	19.46	11.7	9.597	3.262
1962	33.71	28.96	17.37	11.9	9.815	4.947
1963	44.72	38.42	23.86	15.28	14.8	6.731
1964	196	168	112	62.9	50.02	20.38
1965	82.52	72.49	46.92	39.95	34.23	15.8
1966	44.78	38.91	27.49	21.05	19.13	9.552
1967	19.98	17.49	12.42	8.918	8.688	6.027
1968	62.77	54.05	32.89	20.3	17.39	7.017
1969	111	99.74	66.95	38.09	40.4	15.82
1970	165	142	85.43	47.12	36.95	14.94
1971	54.78	47.52	39.69	23.78	19.04	8.677
1972	81.85	70.49	47.45	25.79	20.72	9.317
1973	29.2	26.03	18.49	12.08	9.693	7.067
1974	46.9	40.88	26.77	23.21	19.11	7.407
1975	116	99.62	63.37	35.39	27.97	11.84
1976	52.76	45.78	29.84	20.35	17.67	9.865
1977	40.31	34.76	27.11	17.89	13.85	7.194
1978	58.79	50.8	35.49	21.91	16.54	6.875
1979	72.69	62.82	52.21	32.68	26.48	11.55
1980	89.16	76.92	47.5	25.02	19.3	9.074
1981	17.35	15.23	9.579	7.386	6.207	4.401
1982	81.76	70.86	45.17	32.35	26.12	9.702
1983	19.68	17.19	12.54	7.58	5.731	4.564
1984	18.12	15.88	10.52	8.824	7.741	4.755
1985	49.9	43.24	26.88	22.98	19.65	9.272
1986	50.1	43.95	33.11	27.89	26.03	11.84
1987	45.4	40.54	27.71	20.11	20.38	9.434
1988	13.52	12.58	10.6	7.392	6.826	5.1
1989	46.74	40.56	33.89	21.89	17.02	7.524
1990	18.64	16.25	10.6	8.202	8.004	4.65

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly		
0.032258064516129			196	168	112	62.9	50.02	20.38
0.0645161290322581			165	142	85.43	47.12	40.4	15.82
0.0967741935483871			116	99.74	66.95	39.95	36.95	15.8
0.129032258064516			111	99.62	63.37	38.09	34.23	14.94
0.161290322580645			89.16	76.92	52.21	35.39	27.97	11.84
0.193548387096774			82.52	72.49	47.5	32.68	26.48	11.84
0.225806451612903			81.85	70.86	47.45	32.35	26.12	11.55
0.258064516129032			81.76	70.49	46.92	27.89	26.03	9.865
0.290322580645161			72.69	62.82	45.17	25.79	20.72	9.702
0.32258064516129			62.77	54.05	39.69	25.02	20.38	9.552

0.354838709677419	58.79	50.8	35.49	23.78	19.65	9.434
0.387096774193548	54.78	47.52	33.89	23.21	19.3	9.317
0.419354838709677	52.76	45.78	33.11	22.98	19.13	9.272
0.451612903225806	50.1	43.95	32.89	21.91	19.11	9.074
0.483870967741936	49.9	43.24	29.84	21.89	19.04	8.677
0.516129032258065	46.9	40.88	27.71	21.05	17.67	7.524
0.548387096774194	46.74	40.56	27.49	20.35	17.39	7.407
0.580645161290323	45.4	40.54	27.11	20.3	17.02	7.194
0.612903225806452	44.78	38.91	26.88	20.11	16.54	7.067
0.645161290322581	44.72	38.42	26.77	17.89	14.8	7.017
0.67741935483871	40.31	34.76	23.86	15.28	13.85	6.875
0.709677419354839	35.47	30.53	19.46	12.08	9.815	6.731
0.741935483870968	33.71	28.96	18.49	11.9	9.693	6.027
0.774193548387097	29.2	26.03	17.37	11.7	9.597	5.1
0.806451612903226	19.98	17.49	12.54	8.918	8.688	4.947
0.838709677419355	19.68	17.19	12.42	8.824	8.004	4.755
0.870967741935484	18.64	16.25	10.6	8.202	7.741	4.65
0.903225806451613	18.12	15.88	10.6	7.58	6.826	4.564
0.935483870967742	17.35	15.23	10.52	7.392	6.207	4.401
0.967741935483871	13.52	12.58	9.579	7.386	5.731	3.262

0.1	115.5	99.728	66.592	39.764	36.678	15.714		
					Average of yearly averages:		8.81946666666667	

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: GAPecans_foliar and floor
Metfile: w93805.dvf
PRZM scenario: GAPecansSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable	Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol		
Henry's Law Const.		henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr		
Solubility	sol	1.4	mg/L		
Kd	Kd		mg/L		
Koc	Koc	6040	mg/L		
Photolysis half-life		kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism		kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism		kbacs	63	days	Halfife
Aerobic Soil Metabolism		asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life	
Method: CAM	2	integer	See PRZM manual		
Incorporation Depth:		DEPI	0	cm	
Application Rate:	TAPP	4.5	kg/ha		
Application Efficiency:		APPEFF	0.99	fraction	
Spray Drift	DRFT	0.01	fraction of application rate applied to pond		
Application Date	Date	15-06	dd/mm or dd/mmm or dd-mm or dd-mmm		
Interval 1	interval	10	days	Set to 0 or delete line for single app.	
app. rate 1	apprate	2.2	kg/ha		
Interval 2	interval	10	days	Set to 0 or delete line for single app.	
app. rate 2	apprate	2.2	kg/ha		
Interval 3	interval	10	days	Set to 0 or delete line for single app.	
app. rate 3	apprate	2.2	kg/ha		

Record 17: FILTRA
IPSCND1
UPTKF
Record 18: PLVKRT
PLDKRT
FEXTRC 0.5
Flag for Index Res. Run IR Reservoir
Flag for runoff calc. RUNOFF total none, monthly or total(average of entire run)

KS Sorghum
stored as KS sorghum_ground.out
Chemical: Chlorpyrifos
PRZM environment: KSsorghumSTD.txt modified Tueday, 29 May 2007 at 13:55:46
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w13996.dvf modified Wedday, 3 July 2002 at 10:04:44
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	6.275	5.502	4.163	2.934	2.53	1.115
1962	6.204	5.429	3.6	2.769	2.866	1.396
1963	8.1	7.024	4.372	2.751	2.249	1.015
1964	11.49	9.98	7.898	4.567	4.063	1.733
1965	15.01	13.4	9.366	6.089	4.918	2.187
1966	13.2	11.69	8.663	5.324	4.261	1.736
1967	29.94	26.57	18.35	11.8	9.292	3.53
1968	12.1	10.79	9.131	6.127	5.486	2.652
1969	12.77	11.27	9.956	6.329	4.922	2.138
1970	8.705	7.592	5.308	3.4	2.71	1.406
1971	4.452	3.871	2.719	1.94	1.566	0.9174
1972	3.929	3.448	2.248	1.72	1.702	0.979
1973	15.21	13.19	8.607	5.414	5.109	2.438
1974	5.822	5.274	3.78	2.764	2.439	1.565
1975	5.565	4.849	3.708	2.223	1.756	0.9869
1976	2.276	2.045	1.376	1.209	1.035	0.5813
1977	26.99	23.42	15.66	9.054	7.454	2.767
1978	15.38	14.08	9.123	6.286	5.296	2.475
1979	12.54	10.95	7.957	4.923	4.195	1.966
1980	5.888	5.161	3.639	2.365	2.139	1.433
1981	11.74	10.68	8.081	6.56	5.446	2.309
1982	9.607	8.447	6.593	4.724	4.074	1.88
1983	10.59	9.495	6.07	3.719	2.901	1.376
1984	27.06	23.34	16.01	8.789	6.749	2.453
1985	6.161	5.679	3.968	2.955	2.993	1.758
1986	5.618	4.921	3.994	3.256	2.821	1.46
1987	8.389	7.368	5.235	3.592	3.052	1.367
1988	10.76	9.731	6.382	3.612	2.798	1.161
1989	8.428	7.504	5.236	4.494	4.518	1.963
1990	8.191	7.083	5.205	3.71	3.348	1.617

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.032258064516129		29.94	26.57	18.35	11.8	9.292	3.53
0.0645161290322581		27.06	23.42	16.01	9.054	7.454	2.767
0.0967741935483871		26.99	23.34	15.66	8.789	6.749	2.652
0.129032258064516		15.38	14.08	9.956	6.56	5.486	2.475
0.161290322580645		15.21	13.4	9.366	6.329	5.446	2.453

0.193548387096774	15.01	13.19	9.131	6.286	5.296	2.438
0.225806451612903	13.2	11.69	9.123	6.127	5.109	2.309
0.258064516129032	12.77	11.27	8.663	6.089	4.922	2.187
0.290322580645161	12.54	10.95	8.607	5.414	4.918	2.138
0.32258064516129	12.1	10.79	8.081	5.324	4.518	1.966
0.354838709677419	11.74	10.68	7.957	4.923	4.261	1.963
0.387096774193548	11.49	9.98	7.898	4.724	4.195	1.88
0.419354838709677	10.76	9.731	6.593	4.567	4.074	1.758
0.451612903225806	10.59	9.495	6.382	4.494	4.063	1.736
0.483870967741936	9.607	8.447	6.07	3.719	3.348	1.733
0.516129032258065	8.705	7.592	5.308	3.71	3.052	1.617
0.548387096774194	8.428	7.504	5.236	3.612	2.993	1.565
0.580645161290323	8.389	7.368	5.235	3.592	2.901	1.46
0.612903225806452	8.191	7.083	5.205	3.4	2.866	1.433
0.645161290322581	8.1	7.024	4.372	3.256	2.821	1.406
0.67741935483871	6.275	5.679	4.163	2.955	2.798	1.396
0.709677419354839	6.204	5.502	3.994	2.934	2.71	1.376
0.741935483870968	6.161	5.429	3.968	2.769	2.53	1.367
0.774193548387097	5.888	5.274	3.78	2.764	2.439	1.161
0.806451612903226	5.822	5.161	3.708	2.751	2.249	1.115
0.838709677419355	5.618	4.921	3.639	2.365	2.139	1.015
0.870967741935484	5.565	4.849	3.6	2.223	1.756	0.9869
0.903225806451613	4.452	3.871	2.719	1.94	1.702	0.979
0.935483870967742	3.929	3.448	2.248	1.72	1.566	0.9174
0.967741935483871	2.276	2.045	1.376	1.209	1.035	0.5813

0.1	25.829	22.414	15.0896	8.5661	6.6227	2.6343

Average of yearly averages: 1.74535333333333

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: KS sorghum_ground
Metfile: w13996.dvf
PRZM scenario: KSsorghumSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable	Name	Value	Units	Comments
Molecular weight		mwt	350.6	g/mol	
Henry's Law Const.		henry	6.2e-6	atm-m^3/mol	
Vapor Pressure		vapr	1.87e-5	torr	
Solubility		sol	1.4	mg/L	
Kd	Kd			mg/L	
Koc	Koc	6040		mg/L	
Photolysis half-life		kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism		kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism		kbacs	63	days	Halfife
Aerobic Soil Metabolism		asm	109	days	Halfife
Hydrolysis:	pH 7		81	days	Half-life
Method: CAM	2	integer	See PRZM manual		
Incorporation Depth:		DEPI	0	cm	
Application Rate:		TAPP	0.56	kg/ha	
Application Efficiency:		APPEFF	0.95	fraction	
Spray Drift	DRFT		0.039	fraction of application rate applied to pond	
Application Date	Date		30-05	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval		10	days	Set to 0 or delete line for single app.

app. rate 1	apprate	0.56	kg/ha	
Interval 2	interval	10	days	Set to 0 or delete line for single app.
app. rate 2	apprate	0.56	kg/ha	
Record 17:	FILTRA			
	IPSCND1			
	UPTKF			
Record 18:	PLVKRT			
	PLDKRT			
	FEXTRC	0.5		
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF		total	none, monthly or total(average of entire run)

CA Strawberry
stored as CA Strawberries.out
Chemical: Chlorpyrifos
PRZM environment: CAfruit_WirrigSTD.txt modified Tueday, 29 May 2007 at 13:42:32
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w93193.dvf modified Wedday, 3 July 2002 at 10:04:24
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	3.089	2.706	2.23	1.557	1.187	0.3911
1962	11.41	10.31	7.107	4.031	3.108	1.01
1963	6.614	5.748	4.45	2.964	2.524	0.8571
1964	3.168	2.787	2.304	1.63	1.254	0.4238
1965	7.347	6.396	3.996	2.661	2.267	0.7767
1966	3.166	2.78	2.305	1.624	1.244	0.4335
1967	3.268	2.887	2.426	1.834	1.72	0.6403
1968	3.223	2.833	2.292	1.627	1.258	0.4206
1969	15.63	13.53	8.273	4.857	3.985	1.354
1970	5.096	4.493	3.021	2.405	1.904	0.6472
1971	3.154	2.732	2.265	1.58	1.336	0.4832
1972	3.144	2.758	2.289	1.601	1.22	0.4184
1973	5.788	5.035	3.828	2.432	1.88	0.6101
1974	3.155	2.744	2.276	1.604	1.23	0.4015
1975	3.118	2.717	2.248	1.575	1.209	0.3972
1976	10.63	9.231	6.294	3.673	2.826	0.9418
1977	3.187	2.775	2.31	1.624	1.246	0.414
1978	8.878	7.983	5.813	3.821	3.141	1.039
1979	3.2	2.967	2.391	1.709	1.308	0.4225
1980	11.44	9.897	6.254	3.791	2.974	0.9696
1981	5.044	4.364	3.268	2.13	1.64	0.5313
1982	3.137	2.751	2.269	1.826	1.609	0.5631
1983	4.579	3.976	3.121	2.506	1.989	0.7228
1984	3.241	2.848	2.35	1.654	1.263	0.4101
1985	3.221	2.837	2.335	1.653	1.266	0.4059
1986	7.873	6.807	4.875	3.526	2.8	0.902
1987	3.457	3.031	2.458	1.795	1.4	0.4639
1988	3.146	2.768	2.269	1.657	1.403	0.4944
1989	3.166	2.786	2.298	2.065	1.788	0.6042
1990	3.184	2.772	2.32	1.626	1.262	0.4803

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.032258064516129		15.63	13.53	8.273	4.857	3.985	1.354
0.0645161290322581		11.44	10.31	7.107	4.031	3.141	1.039

0.0967741935483871	11.41	9.897	6.294	3.821	3.108	1.01
0.129032258064516	10.63	9.231	6.254	3.791	2.974	0.9696
0.161290322580645	8.878	7.983	5.813	3.673	2.826	0.9418
0.193548387096774	7.873	6.807	4.875	3.526	2.8	0.902
0.225806451612903	7.347	6.396	4.45	2.964	2.524	0.8571
0.258064516129032	6.614	5.748	3.996	2.661	2.267	0.7767
0.290322580645161	5.788	5.035	3.828	2.506	1.989	0.7228
0.32258064516129	5.096	4.493	3.268	2.432	1.904	0.6472
0.354838709677419	5.044	4.364	3.121	2.405	1.88	0.6403
0.387096774193548	4.579	3.976	3.021	2.13	1.788	0.6101
0.419354838709677	3.457	3.031	2.458	2.065	1.72	0.6042
0.451612903225806	3.268	2.967	2.426	1.834	1.64	0.5631
0.483870967741936	3.241	2.887	2.391	1.826	1.609	0.5313
0.516129032258065	3.223	2.848	2.35	1.795	1.403	0.4944
0.548387096774194	3.221	2.837	2.335	1.709	1.4	0.4832
0.580645161290323	3.2	2.833	2.32	1.657	1.336	0.4803
0.612903225806452	3.187	2.787	2.31	1.654	1.308	0.4639
0.645161290322581	3.184	2.786	2.305	1.653	1.266	0.4335
0.67741935483871	3.168	2.78	2.304	1.63	1.263	0.4238
0.709677419354839	3.166	2.775	2.298	1.627	1.262	0.4225
0.741935483870968	3.166	2.772	2.292	1.626	1.258	0.4206
0.774193548387097	3.155	2.768	2.289	1.624	1.254	0.4184
0.806451612903226	3.154	2.758	2.276	1.624	1.246	0.414
0.838709677419355	3.146	2.751	2.269	1.604	1.244	0.4101
0.870967741935484	3.144	2.744	2.269	1.601	1.23	0.4059
0.903225806451613	3.137	2.732	2.265	1.58	1.22	0.4015
0.935483870967742	3.118	2.717	2.248	1.575	1.209	0.3972
0.967741935483871	3.089	2.706	2.23	1.557	1.187	0.3911

0.1	11.332	9.8304	6.29	3.818	3.0946	1.00596

Average of yearly averages: 0.620986666666667

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: CA Strawberries
Metfile: w93193.dvf
PRZM scenario: CAfruit_WirrigSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd Kd		mg/L		
Koc Koc	6040	mg/L		
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	2	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	2.2	kg/ha	
Application Efficiency:	APPEFF	0.95	fraction	

Spray Drift	DRFT	0.039	fraction of application rate applied to pond	
Application Date	Date	29-01	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	10	days	Set to 0 or delete line for single app.
app. rate 1	apprate	1.1	kg/ha	
Interval 2	interval	10	days	Set to 0 or delete line for single app.
app. rate 2	apprate	1.1	kg/ha	
Record 17:	FILTRA			
	IPSCND1			
	UPTKF			
Record 18:	PLVKRT			
	PLDKRT			
	FEXTRC	0.5		
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF		total	none, monthly or total(average of entire run)

FL Strawberry
stored as FL Strawberries.out
Chemical: Chlorpyrifos
PRZM environment: FLstrawberry_WirrigSTD.txt modified Tueday, 29 May 2007 at 13:53:40
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w12842.dvf modified Wedday, 3 July 2002 at 10:04:28
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	13.04	11.72	8.355	5.599	4.649	2.228
1962	13.89	11.96	8.213	5.302	4.45	3.02
1963	22.17	19.26	15.41	10.78	8.286	3.91
1964	18.81	16.27	10.19	8.369	7.739	5.062
1965	13.35	11.46	8.545	6.626	6.098	3.218
1966	16.61	15.39	9.467	6.966	5.964	3.098
1967	14.33	12.77	9.051	7.431	6.513	3.334
1968	14.04	12.17	8.56	6.264	5.464	2.855
1969	21.32	19.46	14.58	9.106	8.275	4.988
1970	18	15.62	11.4	8.555	7.258	3.587
1971	22.63	19.36	11.45	6.38	5.935	4.058
1972	13.32	11.45	8.167	6.121	6.002	3.574
1973	24.32	20.83	12.82	6.859	5.574	3.334
1974	35.26	30.18	18.3	9.8	7.664	3.288
1975	14.5	12.45	8.775	6.692	5.507	2.766
1976	22.83	20.59	13.43	9.88	8.011	3.607
1977	6.105	5.367	4.087	3.193	2.645	1.709
1978	26.35	23.21	15.49	9.508	7.615	3.493
1979	79.95	70.23	43.76	23.11	18.06	7.972
1980	15.41	13.37	8.651	6.605	6.014	3.459
1981	30.58	26.22	16.09	9.134	7.121	4.177
1982	17.59	15.82	12.08	10.91	9.231	4.612
1983	22.1	19.26	14.94	12.38	11	5.764
1984	12.6	10.86	6.958	4.68	4.522	2.817
1985	18.09	15.49	9.712	7.345	7.325	3.601
1986	24.87	21.43	13.5	7.631	6.211	3.343
1987	45.21	39.11	25.03	15.35	12.72	5.369
1988	15.88	13.83	9.561	7.168	6.019	3.652
1989	9.676	8.839	6.354	5.717	5.487	2.598
1990	16.7	14.45	11.22	7.334	5.985	3.299

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly		
0.032258064516129			79.95	70.23	43.76	23.11	18.06	7.972
0.0645161290322581			45.21	39.11	25.03	15.35	12.72	5.764
0.0967741935483871			35.26	30.18	18.3	12.38	11	5.369
0.129032258064516			30.58	26.22	16.09	10.91	9.231	5.062
0.161290322580645			26.35	23.21	15.49	10.78	8.286	4.988
0.193548387096774			24.87	21.43	15.41	9.88	8.275	4.612
0.225806451612903			24.32	20.83	14.94	9.8	8.011	4.177
0.258064516129032			22.83	20.59	14.58	9.508	7.739	4.058
0.290322580645161			22.63	19.46	13.5	9.134	7.664	3.91
0.32258064516129			22.17	19.36	13.43	9.106	7.615	3.652
0.354838709677419			22.1	19.26	12.82	8.555	7.325	3.607
0.387096774193548			21.32	19.26	12.08	8.369	7.258	3.601
0.419354838709677			18.81	16.27	11.45	7.631	7.121	3.587
0.451612903225806			18.09	15.82	11.4	7.431	6.513	3.574
0.483870967741936			18	15.62	11.22	7.345	6.211	3.493
0.516129032258065			17.59	15.49	10.19	7.334	6.098	3.459
0.548387096774194			16.7	15.39	9.712	7.168	6.019	3.343
0.580645161290323			16.61	14.45	9.561	6.966	6.014	3.334
0.612903225806452			15.88	13.83	9.467	6.859	6.002	3.334
0.645161290322581			15.41	13.37	9.051	6.692	5.985	3.299
0.67741935483871			14.5	12.77	8.775	6.626	5.964	3.288
0.709677419354839			14.33	12.45	8.651	6.605	5.935	3.218
0.741935483870968			14.04	12.17	8.56	6.38	5.574	3.098
0.774193548387097			13.89	11.96	8.545	6.264	5.507	3.02
0.806451612903226			13.35	11.72	8.355	6.121	5.487	2.855
0.838709677419355			13.32	11.46	8.213	5.717	5.464	2.817
0.870967741935484			13.04	11.45	8.167	5.599	4.649	2.766
0.903225806451613			12.6	10.86	6.958	5.302	4.522	2.598
0.935483870967742			9.676	8.839	6.354	4.68	4.45	2.228
0.967741935483871			6.105	5.367	4.087	3.193	2.645	1.709
0.1	34.792	29.784	18.079	12.233	10.8231	5.3383		
						Average of yearly averages:		3.7264

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: FL Strawberries
Metfile: w12842.dvf
PRZM scenario: FLstrawberry_WirrigSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable	Name	Value	Units	Comments
Molecular weight		mwt	350.6	g/mol	
Henry's Law Const.		henry	6.2e-6	atm-m^3/mol	
Vapor Pressure		vapr	1.87e-5	torr	
Solubility		sol	1.4	mg/L	
Kd	Kd			mg/L	
Koc	Koc	6040		mg/L	
Photolysis half-life		kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism		kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism		kbacs	63	days	Halfife
Aerobic Soil Metabolism		asm	109	days	Halfife
Hydrolysis:		pH 7	81	days	Half-life
Method: CAM		2	integer	See PRZM manual	

Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	2.2	kg/ha	
Application Efficiency:	APPEFF	0.95	fraction	
Spray Drift	DRFT	0.039	fraction of application rate applied to pond	
Application Date	Date	29-01	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	10	days	Set to 0 or delete line for single app.
app. rate 1	apprate	1.1	kg/ha	
Interval 2	interval	10	days	Set to 0 or delete line for single app.
app. rate 2	apprate	1.1	kg/ha	
Record 17:	FILTRA			
	IPSCND	1		
	UPTKF			
Record 18:	PLVKRT			
	PLDKRT			
	FEXTRC	0.5		
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)	

MN Sugarbeets
stored as MNSugarbeets.out
Chemical: Chlorpyrifos
PRZM environment: MNsugarbeetSTD.txt modified Tueday, 29 May 2007 at 13:57:22
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w14914.dvf modified Wedday, 3 July 2002 at 10:05:52
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	1.635	1.501	1.021	0.6292	0.5395	0.247
1962	4.436	3.928	2.812	1.948	1.733	0.7606
1963	3.733	3.231	1.997	1.102	0.8626	0.5191
1964	10.86	9.384	5.736	3.085	2.606	1.031
1965	1.669	1.484	1.117	0.8728	0.8369	0.6246
1966	2.178	1.909	1.491	1.065	0.86	0.4879
1967	0.9462	0.8364	0.7006	0.4827	0.4335	0.2586
1968	0.9537	0.8333	0.6658	0.495	0.398	0.2101
1969	5.972	5.204	4.154	2.353	1.854	0.7659
1970	3.974	3.441	2.13	1.231	1.023	0.693
1971	2.48	2.157	1.437	1.209	1.123	0.6494
1972	1.206	1.07	0.7858	0.6034	0.6004	0.4603
1973	2.73	2.388	1.58	1.22	1.012	0.4791
1974	7.636	6.633	4.177	3.183	2.526	1.129
1975	12.77	11.55	8.136	4.954	3.901	1.672
1976	1.025	1.017	0.9872	0.9313	0.9024	0.4794
1977	7.733	6.66	4.05	2.259	1.897	0.9291
1978	6.034	5.424	3.472	2.2	2.06	1.019
1979	3.095	2.722	1.841	1.499	1.254	0.775
1980	3.116	2.707	1.903	1.515	1.234	0.6298
1981	1.829	1.612	1.078	0.836	0.769	0.4546
1982	5.063	4.366	2.648	1.559	1.271	0.5194
1983	3.069	2.668	2.053	1.403	1.2	0.6845
1984	11.17	9.692	6.305	3.527	2.72	1.247
1985	2.813	2.496	1.897	1.538	1.427	0.8456
1986	5.884	5.099	3.235	2.158	1.839	0.8638
1987	2.24	1.947	1.228	0.8124	0.7209	0.4689
1988	1.74	1.588	1.013	0.6866	0.5831	0.3359
1989	3.791	3.377	2.383	1.415	1.159	0.568

1990	5.441	4.737	3.035	2.002	1.591	0.7471

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly		
0.032258064516129			12.77	11.55	8.136	4.954	3.901	1.672
0.0645161290322581			11.17	9.692	6.305	3.527	2.72	1.247
0.0967741935483871			10.86	9.384	5.736	3.183	2.606	1.129
0.129032258064516			7.733	6.66	4.177	3.085	2.526	1.031
0.161290322580645			7.636	6.633	4.154	2.353	2.06	1.019
0.193548387096774			6.034	5.424	4.05	2.259	1.897	0.9291
0.225806451612903			5.972	5.204	3.472	2.2	1.854	0.8638
0.258064516129032			5.884	5.099	3.235	2.158	1.839	0.8456
0.290322580645161			5.441	4.737	3.035	2.002	1.733	0.775
0.32258064516129			5.063	4.366	2.812	1.948	1.591	0.7659
0.354838709677419			4.436	3.928	2.648	1.559	1.427	0.7606
0.387096774193548			3.974	3.441	2.383	1.538	1.271	0.7471
0.419354838709677			3.791	3.377	2.13	1.515	1.254	0.693
0.451612903225806			3.733	3.231	2.053	1.499	1.234	0.6845
0.483870967741936			3.116	2.722	1.997	1.415	1.2	0.6494
0.516129032258065			3.095	2.707	1.903	1.403	1.159	0.6298
0.548387096774194			3.069	2.668	1.897	1.231	1.123	0.6246
0.580645161290323			2.813	2.496	1.841	1.22	1.023	0.568
0.612903225806452			2.73	2.388	1.58	1.209	1.012	0.5194
0.645161290322581			2.48	2.157	1.491	1.102	0.9024	0.5191
0.67741935483871			2.24	1.947	1.437	1.065	0.8626	0.4879
0.709677419354839			2.178	1.909	1.228	0.9313	0.86	0.4794
0.741935483870968			1.829	1.612	1.117	0.8728	0.8369	0.4791
0.774193548387097			1.74	1.588	1.078	0.836	0.769	0.4689
0.806451612903226			1.669	1.501	1.021	0.8124	0.7209	0.4603
0.838709677419355			1.635	1.484	1.013	0.6866	0.6004	0.4546
0.870967741935484			1.206	1.07	0.9872	0.6292	0.5831	0.3359
0.903225806451613			1.025	1.017	0.7858	0.6034	0.5395	0.2586
0.935483870967742			0.9537	0.8364	0.7006	0.495	0.4335	0.247
0.967741935483871			0.9462	0.8333	0.6658	0.4827	0.398	0.2101
0.1	10.5473	9.1116	5.5801	3.1732	2.598	1.1192		

Average of yearly averages: 0.685156666666667

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: MNSugarbeets
Metfile: w14914.dvf
PRZM scenario: MNsugarbeetSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable	Name	Value	Units	Comments
Molecular weight		mwt	350.6	g/mol	
Henry's Law Const.		henry	6.2e-6	atm-m^3/mol	
Vapor Pressure		vapr	1.87e-5	torr	
Solubility		sol	1.4	mg/L	
Kd	Kd		mg/L		
Koc	Koc	6040	mg/L		
Photolysis half-life		kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism		kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism		kbacs	63	days	Halfife

Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	2	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	1.1	kg/ha	
Application Efficiency:	APPEFF	0.99	fraction	
Spray Drift	DRFT	0.01	fraction of application rate applied to pond	
Application Date	Date	28-05	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	10	days	Set to 0 or delete line for single app.
app. rate 1	apprate	1.1	kg/ha	
Interval 2	interval	10	days	Set to 0 or delete line for single app.
app. rate 2	apprate	1.1	kg/ha	
Record 17:	FILTRA			
IPSCND	1			
UPTKF				
Record 18:	PLVKRT			
PLDKRT				
FEXTRC	0.5			
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)	

Sugarbeet Average Typical Rate

Beets 1.68 and 0.56

WATER COLUMN DISSOLVED CONCENTRATION (PPB)

YEAR	PEAK	96 HOUR	21 DAY	60 DAY	90 DAY	YEARLY
1961	11.790	10.200	6.508	3.720	3.025	1.180
1962	17.360	15.260	10.140	7.056	5.877	2.336
1963	5.842	5.103	3.664	2.151	2.058	1.156
1964	13.450	11.590	7.062	3.813	3.228	1.301
1965	1.901	1.695	1.294	1.043	1.081	.769
1966	2.499	2.180	1.687	1.194	.963	.519
1967	1.095	.972	.664	.496	.453	.275
1968	.933	.828	.576	.461	.417	.226
1969	6.967	6.075	4.887	2.801	2.261	.956
1970	4.459	3.869	2.426	1.761	1.399	.935
1971	6.937	6.122	4.058	2.489	1.978	1.184
1972	6.092	5.285	3.409	1.944	1.659	.899
1973	2.999	2.617	1.724	1.347	1.115	.543
1974	8.403	7.303	4.644	3.591	2.867	1.418
1975	15.180	13.700	9.584	5.829	4.590	1.924
1976	1.170	1.161	1.124	1.054	1.016	.477
1977	9.209	7.965	4.953	3.439	2.852	1.267
1978	10.850	9.376	5.785	3.490	3.091	1.410
1979	3.559	3.121	2.097	1.644	1.358	.882
1980	3.684	3.187	2.210	1.745	1.418	.671
1981	14.550	12.800	8.455	5.030	4.065	1.560
1982	5.695	4.904	2.975	1.770	1.451	.783
1983	3.452	2.993	2.309	1.582	1.346	.769
1984	21.820	18.870	11.900	6.601	5.090	2.033

1985	10.310	9.072	6.339	4.798	4.173	1.941
1986	6.908	5.996	3.845	2.605	2.227	1.178
1987	4.828	4.239	3.523	2.086	1.909	.913
1988	1.926	1.757	1.113	.766	.648	.396
1989	4.413	3.947	2.779	1.674	1.376	.707
1990	8.049	6.958	4.903	3.566	2.807	1.182

SORTED FOR PLOTTING

PROB	PEAK	96 HOUR	21 DAY	60 DAY	90 DAY	YEARLY
.031	21.820	18.870	11.900	7.056	5.877	2.336
.063	17.360	15.260	10.140	6.601	5.090	2.033
.094	15.180	13.700	9.584	5.829	4.590	1.941
.125	14.550	12.800	8.455	5.030	4.173	1.924
.156	13.450	11.590	7.062	4.798	4.065	1.560
.188	11.790	10.200	6.508	3.813	3.228	1.418
.219	10.850	9.376	6.339	3.720	3.091	1.410
.250	10.310	9.072	5.785	3.591	3.025	1.301
.281	9.209	7.965	4.953	3.566	2.867	1.267
.313	8.403	7.303	4.903	3.490	2.852	1.184
.344	8.049	6.958	4.887	3.439	2.807	1.182
.375	6.967	6.122	4.644	2.801	2.261	1.180
.406	6.937	6.075	4.058	2.605	2.227	1.178
.438	6.908	5.996	3.845	2.489	2.058	1.156
.469	6.092	5.285	3.664	2.151	1.978	.956
.500	5.842	5.103	3.523	2.086	1.909	.935
.531	5.695	4.904	3.409	1.944	1.659	.913
.563	4.828	4.239	2.975	1.770	1.451	.899
.594	4.459	3.947	2.779	1.761	1.418	.882
.625	4.413	3.869	2.426	1.745	1.399	.783
.656	3.684	3.187	2.309	1.674	1.376	.769
.688	3.559	3.121	2.210	1.644	1.358	.769
.719	3.452	2.993	2.097	1.582	1.346	.707
.750	2.999	2.617	1.724	1.347	1.115	.671
.781	2.499	2.180	1.687	1.194	1.081	.543
.813	1.926	1.757	1.294	1.054	1.016	.519
.844	1.901	1.695	1.124	1.043	.963	.477
.875	1.170	1.161	1.113	.766	.648	.396
.906	1.095	.972	.664	.496	.453	.275
.938	.933	.828	.576	.461	.417	.226
.969	.000	.000	.000	.000	.000	.000
1/10	15.054	13.520	9.358	5.669	4.507	1.938

MEAN OF ANNUAL VALUES = 1.060

STANDARD DEVIATION OF ANNUAL VALUES = .527

UPPER 90% CONFIDENCE LIMIT ON MEAN = 1.200

MN Sugarbeets; 8/15/2001
"Polk County, MN; MLRA: 56; Metfile: W14914.dvf (old: Met56.met),

```
*** Record 3:
   0.75    0.36       0    12.5       1       1
*** Record 6 -- ERFLAG
       4
*** Record 7:
   0.28    0.25     0.6   172.8             3     1.5     600
*** Record 8
       1
*** Record 9
       1     0.2     100     100       3  91  85  91       0      76
*** Record 9a-e
       1      28
1605 0106 1606 2506 0107 1607 0108 1608 0109 1609 0110 1610 2010 0111 1611 0112
.609 .436 .252 .162 .128 .119 .123 .125 .126 .127 .173 .195 .017 .048 .058 .066
.014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014
  85   85   85   85   85   85   85   85   85   85   85   91   91   91   91   91
1612  0101 1601 0102 1602 0103 1603 0104 1504 1604 2504 0105
.072 .278 .285 .292 .301 .316 .345 .382 .538 .555 .618 .638
.014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014
  91   91   91   91   91   91   91   91   91   91   91   91
*** Record 10 -- NCPDS, the number of cropping periods
      30
*** Record 11
  160561  011061  151061       1
  160562  011062  151062       1
  160563  011063  151063       1
  160564  011064  151064       1
  160565  011065  151065       1
  160566  011066  151066       1
  160567  011067  151067       1
  160568  011068  151068       1
  160569  011069  151069       1
  160570  011070  151070       1
  160571  011071  151071       1
  160572  011072  151072       1
  160573  011073  151073       1
  160574  011074  151074       1
  160575  011075  151075       1
  160576  011076  151076       1
  160577  011077  151077       1
  160578  011078  151078       1
  160579  011079  151079       1
  160580  011080  151080       1
  160581  011081  151081       1
  160582  011082  151082       1
  160583  011083  151083       1
  160584  011084  151084       1
  160585  011085  151085       1
  160586  011086  151086       1
  160587  011087  151087       1
  160588  011088  151088       1
  160589  011089  151089       1
  160590  011090  151090       1
*** Record 12 -- PTITLE
Chlorpyrifos - 2 applications @ 0.89              0.89 kg/ha
*** Record 13
```

```
    60      1       0       0
*** Record 15 -- PSTNAM
Chlorpyrifos
*** Record 16
 050561  0 4  0.6  1.68 1.00 .0
 250561  0 2  4.0  0.56  .99 .01
 050562  0 4  0.6  1.68 1.00 .0
 250562  0 2  4.0  0.56  .99 .01
 050563  0 4  0.6  1.68 1.00 .0
 250563  0 2  4.0  0.56  .99 .01
 050564  0 4  0.6  1.68 1.00 .0
 250564  0 2  4.0  0.56  .99 .01
 050565  0 4  0.6  1.68 1.00 .0
 250565  0 2  4.0  0.56  .99 .01
 050566  0 4  0.6  1.68 1.00 .0
 250566  0 2  4.0  0.56  .99 .01
 050567  0 4  0.6  1.68 1.00 .0
 250567  0 2  4.0  0.56  .99 .01
 050568  0 4  0.6  1.68 1.00 .0
 250568  0 2  4.0  0.56  .99 .01
 050569  0 4  0.6  1.68 1.00 .0
 250569  0 2  4.0  0.56  .99 .01
 050570  0 4  0.6  1.68 1.00 .0
 250570  0 2  4.0  0.56  .99 .01
 050571  0 4  0.6  1.68 1.00 .0
 250571  0 2  4.0  0.56  .99 .01
 050572  0 4  0.6  1.68 1.00 .0
 250572  0 2  4.0  0.56  .99 .01
 050573  0 4  0.6  1.68 1.00 .0
 250573  0 2  4.0  0.56  .99 .01
 050574  0 4  0.6  1.68 1.00 .0
 250574  0 2  4.0  0.56  .99 .01
 050575  0 4  0.6  1.68 1.00 .0
 250575  0 2  4.0  0.56  .99 .01
 050576  0 4  0.6  1.68 1.0  .0
 250576  0 2  4.0  0.56  .99 .01
 050577  0 4  0.6  1.68 1.00 .0
 250577  0 2  4.0  0.56  .99 .01
 050578  0 4  0.6  1.68 1.00 .0
 250578  0 2  4.0  0.56  .99 .01
 050579  0 4  0.6  1.68 1.00 .0
 250579  0 2  4.0  0.56  .99 .01
 050580  0 4  0.6  1.68 1.00 .0
 250580  0 2  4.0  0.56  .99 .01
 050581  0 4  0.6  1.68 1.00 .0
 250581  0 2  4.0  0.56  .99 .01
 050582  0 4  0.6  1.68 1.00 .0
 250582  0 2  4.0  0.56  .99 .01
 050583  0 4  0.6  1.68 1.00 .0
 250583  0 2  4.0  0.56  .99 .01
 050584  0 4  0.6  1.68 1.00 .0
 250584  0 2  4.0  0.56  .99 .01
 050585  0 4  0.6  1.68 1.00 .0
 250585  0 2  4.0  0.56  .99 .01
 050586  0 4  0.6  1.68 1.00 .0
 250586  0 2  4.0  0.56  .99 .01
```

```
 050587  0 4  0.6  1.68 1.00 .0
 250587  0 2  4.0  0.56  .99 .01
 050588  0 4  0.6  1.68 1.00 .0
 250588  0 2  4.0  0.56  .99 .01
 050589  0 4  0.6  1.68 1.00 .0
 250589  0 2  4.0  0.56  .99 .01
 050590  0 4  0.6  1.68 1.00 .0
 250590  0 2  4.0  0.56  .99 .01
*** Record 17
     0       1       0
*** Record 18
     0       0     0.5
*** Record 19 -- STITLE
Bearden silty clay loam - Hydg. C
*** Record 20
    100          0   0   1   0   0   0   0   0   0   0
*** Record 26
     0       0       0
*** Record 30
     4    6040
*** Record 33
     4
     1      10     1.4   0.377       0       0       0
      0.0063590.006359       0
           0.1   0.377   0.207    4.06       0
     2       8     1.4   0.377       0       0       0
      0.0063590.006359       0
           4   0.377   0.207    4.06       0
     3      54     1.5   0.292       0       0       0
      0.0063590.006359       0
           3   0.292   0.132   0.174       0
     4      28     1.8   0.285       0       0       0
      0.0063590.006359       0
           4   0.285   0.125   0.116       0
***Record 40
     0
        YEAR      10          YEAR      10          YEAR      10   1
     1
     1 -----
     7   YEAR
   PRCP    TCUM   0   0
   RUNF    TCUM   0   0
   INFL    TCUM   1   1
   ESLS    TCUM   0   0  1.0E3
   RFLX    TCUM   0   0  1.0E5
   EFLX    TCUM   0   0  1.0E5
   RZFX    TCUM   0   0  1.0E5
```

Sunflower, Wheat
stored as TX wheat_sunflower.out
Chemical: Chlorpyrifos
PRZM environment: TXwheatOP.txt modified Thuday, 14 June 2007 at 11:24:44
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w13958.dvf modified Wedday, 3 July 2002 at 10:06:24
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	78.08	67.16	41.94	29.08	21.9	6.899
1962	36.31	30.94	20.38	13.63	10.55	5.648
1963	7.149	6.394	4.483	3.575	3.221	1.881
1964	90.46	76.79	44.53	21.85	16.38	6.804
1965	30.36	26.06	17.14	10.18	9.419	5.086
1966	32.57	29.53	19.64	12.24	9.312	4.056
1967	17.15	14.99	10.9	9.662	9.102	3.95
1968	28.13	24.29	14.47	8.196	7.142	4.645
1969	24.15	21.68	17	10.16	8.237	4.313
1970	9.4	8.175	5.491	4.364	3.702	2.736
1971	32.1	29.6	18.7	10.19	8.401	3.606
1972	15.29	13.14	8.131	6.037	5.165	2.865
1973	41.14	37.57	30.42	19.82	15.07	6.301
1974	38.27	32.72	19.57	13.31	10.2	5.622
1975	38.3	33.65	24.8	16.07	12.92	6.287
1976	29.68	25.59	21.35	13	10.75	5.047
1977	13.11	11.23	7.927	4.361	3.391	2.149
1978	17.06	14.62	8.646	6.386	5.268	3.197
1979	63.61	54.65	41.54	22.73	17.44	6.646
1980	13.23	12.07	7.587	5.376	4.994	2.791
1981	126	113	74.9	40.95	30.43	10.61
1982	10.26	8.881	5.51	4.231	3.802	2.409
1983	17.58	15.11	9.399	6.482	6.067	3.24
1984	22.13	19.9	15.17	9.105	7.37	2.597
1985	35.75	30.7	20.06	12.38	9.27	5.282
1986	24.74	21.44	14.19	9.893	8.246	3.913
1987	42.98	37.19	28.16	20.79	16.21	6.705
1988	6.984	6.133	4.301	3.952	3.746	2.033
1989	12.11	10.72	6.569	3.862	3.773	2.063
1990	15.63	13.4	8.776	5.092	4.107	2.716

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.032258064516129		126	113	74.9	40.95	30.43	10.61
0.0645161290322581		90.46	76.79	44.53	29.08	21.9	6.899
0.0967741935483871		78.08	67.16	41.94	22.73	17.44	6.804
0.129032258064516		63.61	54.65	41.54	21.85	16.38	6.705
0.161290322580645		42.98	37.57	30.42	20.79	16.21	6.646
0.193548387096774		41.14	37.19	28.16	19.82	15.07	6.301
0.225806451612903		38.3	33.65	24.8	16.07	12.92	6.287
0.258064516129032		38.27	32.72	21.35	13.63	10.75	5.648
0.290322580645161		36.31	30.94	20.38	13.31	10.55	5.622
0.32258064516129		35.75	30.7	20.06	13	10.2	5.282
0.354838709677419		32.57	29.6	19.64	12.38	9.419	5.086
0.387096774193548		32.1	29.53	19.57	12.24	9.312	5.047
0.419354838709677		30.36	26.06	18.7	10.19	9.27	4.645
0.451612903225806		29.68	25.59	17.14	10.18	9.102	4.313
0.483870967741936		28.13	24.29	17	10.16	8.401	4.056
0.516129032258065		24.74	21.68	15.17	9.893	8.246	3.95
0.548387096774194		24.15	21.44	14.47	9.662	8.237	3.913
0.580645161290323		22.13	19.9	14.19	9.105	7.37	3.606
0.612903225806452		17.58	15.11	10.9	8.196	7.142	3.24
0.645161290322581		17.15	14.99	9.399	6.482	6.067	3.197
0.67741935483871		17.06	14.62	8.776	6.386	5.268	2.865
0.709677419354839		15.63	13.4	8.646	6.037	5.165	2.791

0.741935483870968			15.29	13.14	8.131	5.376	4.994	2.736
0.774193548387097			13.23	12.07	7.927	5.092	4.107	2.716
0.806451612903226			13.11	11.23	7.587	4.364	3.802	2.597
0.838709677419355			12.11	10.72	6.569	4.361	3.773	2.409
0.870967741935484			10.26	8.881	5.51	4.231	3.746	2.149
0.903225806451613			9.4	8.175	5.491	3.952	3.702	2.063
0.935483870967742			7.149	6.394	4.483	3.862	3.391	2.033
0.967741935483871			6.984	6.133	4.301	3.575	3.221	1.881
0.1	76.633	65.909	41.9	22.642	17.334	6.7941		
					Average of yearly averages:			4.40323333333333

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: TX wheat_sunflower
Metfile: w13958.dvf
PRZM scenario: TXwheatOP.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd Kd	Kd		mg/L	
Koc Koc	Koc	6040	mg/L	
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	2	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	1.7	kg/ha	
Application Efficiency:	APPEFF	0.99	fraction	
Spray Drift	DRFT	0.01	fraction of application rate applied to pond	
Application Date	Date	27-05	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	10	days	Set to 0 or delete line for single app.
app. rate 1	apprate	1.7	kg/ha	
Interval 2	interval	158	days	Set to 0 or delete line for single app.
app. rate 2	apprate	0.56	kg/ha	
Interval 3	interval	10	days	Set to 0 or delete line for single app.
app. rate 3	apprate	0.56	kg/ha	
Record 17:	FILTRA			
IPSCND	1			
UPTKF				
Record 18:	PLVKRT			
PLDKRT				
FEXTRC		0.5		
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF		total	none, monthly or total(average of entire run)

MS Soybean (surrogate for soybean)
stored as MSsoybean_aerial.out
Chemical: Chlorpyrifos

PRZM environment: MSsoybeanSTD.txt modified Tueday, 29 May 2007 at 13:58:06
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w03940.dvf modified Wedday, 3 July 2002 at 10:05:46
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	19.49	16.95	10.59	7.764	6.108	2.454
1962	3.911	3.47	2.871	2.403	2.097	1.408
1963	22.41	19.37	11.83	7.027	5.407	2.242
1964	15.82	13.67	8.315	4.849	4.39	2.767
1965	18.25	15.6	9.37	4.891	3.715	2.165
1966	15.73	14.63	10.99	6.265	5.562	2.804
1967	12.57	11.39	9.16	7.008	5.742	2.607
1968	12.28	10.7	7.329	4.374	3.432	1.809
1969	6.549	5.661	3.465	2.084	1.837	1.27
1970	8.799	7.702	6.011	4.285	3.687	1.94
1971	9.528	8.267	5.121	3.26	3.109	2.248
1972	3.653	3.225	2.431	1.865	1.702	1.377
1973	4.429	3.971	3.184	2.065	1.79	1.356
1974	21.48	18.62	11.5	6.242	5.065	2.795
1975	19.3	16.81	13.4	9.1	8.009	4.017
1976	16.65	14.56	10.79	7.896	6.504	3.219
1977	8.815	7.663	4.814	4.102	3.595	2.332
1978	8.644	7.582	6.252	4.032	3.513	2.072
1979	33.46	29.7	20.97	16.67	14.26	6.639
1980	13.15	11.67	9.108	6.18	5.07	2.948
1981	28.1	24.93	15.55	10.3	8.87	3.478
1982	29.43	25.48	15.79	12.71	10.24	4.692
1983	20.33	18.58	13.58	8.314	6.646	3.787
1984	9.292	8.34	5.25	3.823	3.407	2.448
1985	15.56	13.43	8.166	4.45	3.906	2.208
1986	32.24	28.04	21.05	12.63	10.07	3.889
1987	23.91	21.41	14.35	7.943	6.175	2.786
1988	5.35	4.685	3.125	2.741	2.461	1.618
1989	29.69	25.85	17.9	11.87	9.615	3.977
1990	6.934	6.106	4.957	3.294	2.665	1.951

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly		
0.032258064516129			33.46	29.7	21.05	16.67	14.26	6.639
0.0645161290322581			32.24	28.04	20.97	12.71	10.24	4.692
0.0967741935483871			29.69	25.85	17.9	12.63	10.07	4.017
0.129032258064516			29.43	25.48	15.79	11.87	9.615	3.977
0.161290322580645			28.1	24.93	15.55	10.3	8.87	3.889
0.193548387096774			23.91	21.41	14.35	9.1	8.009	3.787
0.225806451612903			22.41	19.37	13.58	8.314	6.646	3.478
0.258064516129032			21.48	18.62	13.4	7.943	6.504	3.219
0.290322580645161			20.33	18.58	11.83	7.896	6.175	2.948
0.32258064516129			19.49	16.95	11.5	7.764	6.108	2.804
0.354838709677419			19.3	16.81	10.99	7.027	5.742	2.795
0.387096774193548			18.25	15.6	10.79	7.008	5.562	2.786
0.419354838709677			16.65	14.63	10.59	6.265	5.407	2.767
0.451612903225806			15.82	14.56	9.37	6.242	5.07	2.607
0.483870967741936			15.73	13.67	9.16	6.18	5.065	2.454
0.516129032258065			15.56	13.43	9.108	4.891	4.39	2.448
0.548387096774194			13.15	11.67	8.315	4.849	3.906	2.332

0.580645161290323		12.57	11.39	8.166	4.45	3.715	2.248
0.612903225806452		12.28	10.7	7.329	4.374	3.687	2.242
0.645161290322581		9.528	8.34	6.252	4.285	3.595	2.208
0.67741935483871		9.292	8.267	6.011	4.102	3.513	2.165
0.709677419354839		8.815	7.702	5.25	4.032	3.432	2.072
0.741935483870968		8.799	7.663	5.121	3.823	3.407	1.951
0.774193548387097		8.644	7.582	4.957	3.294	3.109	1.94
0.806451612903226		6.934	6.106	4.814	3.26	2.665	1.809
0.838709677419355		6.549	5.661	3.465	2.741	2.461	1.618
0.870967741935484		5.35	4.685	3.184	2.403	2.097	1.408
0.903225806451613		4.429	3.971	3.125	2.084	1.837	1.377
0.935483870967742		3.911	3.47	2.871	2.065	1.79	1.356
0.967741935483871		3.653	3.225	2.431	1.865	1.702	1.27

0.1	29.664	25.813	17.689	12.554	10.0245	4.013	
					Average of yearly averages:		2.7101

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: MSsoybean_aerial
Metfile: w03940.dvf
PRZM scenario: MSsoybeanSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable	Name	Value	Units	Comments
Molecular weight		mwt	350.6	g/mol	
Henry's Law Const.		henry	6.2e-6	atm-m^3/mol	
Vapor Pressure		vapr	1.87e-5	torr	
Solubility		sol	1.4	mg/L	
Kd	Kd			mg/L	
Koc	Koc	6040		mg/L	
Photolysis half-life		kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism		kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism		kbacs	63	days	Halfife
Aerobic Soil Metabolism		asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life	
Method: CAM	2	integer	See PRZM manual		
Incorporation Depth:		DEPI	0	cm	
Application Rate:		TAPP	1.1	kg/ha	
Application Efficiency:		APPEFF	0.95	fraction	
Spray Drift		DRFT	0.039	fraction of application rate applied to pond	
Application Date		Date	15-5	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1		interval	10	days	Set to 0 or delete line for single app.
app. rate 1		apprate	1.1	kg/ha	
Interval 2		interval	10	days	Set to 0 or delete line for single app.
app. rate 2		apprate	1.1	kg/ha	
Record 17:		FILTRA			
	IPSCND	1			
	UPTKF				
Record 18:		PLVKRT			
	PLDKRT				
	FEXTRC	0.5			
Flag for Index Res. Run		IR	Reservoir		
Flag for runoff calc.		RUNOFF	total	none, monthly or total(average of entire run)	

MS Bean
stored as MsBeans.out
Chemical: Chlorpyrifos
PRZM environment: MSsoybeanSTD.txt modified Tueday, 29 May 2007 at 13:58:06
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w03940.dvf modified Wedday, 3 July 2002 at 10:05:46
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	5.473	4.749	2.946	2.184	1.714	0.6704
1962	0.9707	0.9012	0.8225	0.7112	0.6196	0.3743
1963	6.872	5.935	3.609	2.117	1.626	0.6414
1964	4.729	4.084	2.478	1.441	1.303	0.8026
1965	5.527	4.721	2.825	1.465	1.109	0.6013
1966	3.26	2.863	1.753	1.01	0.8172	0.4982
1967	4.035	3.5	2.168	1.682	1.376	0.6362
1968	4.772	4.146	2.587	1.42	1.117	0.552
1969	1.875	1.617	0.9805	0.5739	0.4799	0.3317
1970	2.63	2.3	1.793	1.271	1.093	0.5391
1971	2.881	2.496	1.537	0.9483	0.9086	0.6258
1972	1.142	1.007	0.7555	0.5577	0.5087	0.3713
1973	1.303	1.169	0.6547	0.5354	0.4465	0.3355
1974	5.728	4.965	3.066	1.658	1.361	0.7717
1975	5.96	5.175	4.112	2.669	2.319	1.138
1976	6.888	6.008	4.211	2.805	2.257	1.042
1977	2.169	1.911	1.298	1.057	0.9256	0.6472
1978	1.849	1.622	1.073	0.6541	0.5769	0.4813
1979	10.03	8.886	6.224	4.789	4.122	1.932
1980	1.485	1.395	1.269	1.088	1.016	0.6324
1981	8.012	7.092	4.37	2.772	2.251	0.8916
1982	8.07	6.977	4.302	3.545	2.863	1.309
1983	2.352	2.044	1.489	1.132	1.016	0.7
1984	2.867	2.571	1.609	1.168	0.918	0.6719
1985	4.584	3.951	2.388	1.291	1.134	0.6088
1986	14.72	12.77	8.85	5.088	3.942	1.406
1987	7.36	6.57	4.405	2.43	1.878	0.8327
1988	1.515	1.324	0.8777	0.7687	0.6897	0.4275
1989	7.89	6.835	4.671	2.865	2.22	0.9642
1990	2.75	2.41	1.648	1.018	0.7955	0.5801

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.032258064516129		14.72	12.77	8.85	5.088	4.122	1.932
0.0645161290322581		10.03	8.886	6.224	4.789	3.942	1.406
0.0967741935483871		8.07	7.092	4.671	3.545	2.863	1.309
0.129032258064516		8.012	6.977	4.405	2.865	2.319	1.138
0.161290322580645		7.89	6.835	4.37	2.805	2.257	1.042
0.193548387096774		7.36	6.57	4.302	2.772	2.251	0.9642
0.225806451612903		6.888	6.008	4.211	2.669	2.22	0.8916
0.258064516129032		6.872	5.935	4.112	2.43	1.878	0.8327
0.290322580645161		5.96	5.175	3.609	2.184	1.714	0.8026
0.32258064516129		5.728	4.965	3.066	2.117	1.626	0.7717
0.354838709677419		5.527	4.749	2.946	1.682	1.376	0.7
0.387096774193548		5.473	4.721	2.825	1.658	1.361	0.6719
0.419354838709677		4.772	4.146	2.587	1.465	1.303	0.6704
0.451612903225806		4.729	4.084	2.478	1.441	1.134	0.6472

0.483870967741936	4.584	3.951	2.388	1.42	1.117	0.6414
0.516129032258065	4.035	3.5	2.168	1.291	1.109	0.6362
0.548387096774194	3.26	2.863	1.793	1.271	1.093	0.6324
0.580645161290323	2.881	2.571	1.753	1.168	1.016	0.6258
0.612903225806452	2.867	2.496	1.648	1.132	1.016	0.6088
0.645161290322581	2.75	2.41	1.609	1.088	0.9256	0.6013
0.67741935483871	2.63	2.3	1.537	1.057	0.918	0.5801
0.709677419354839	2.352	2.044	1.489	1.018	0.9086	0.552
0.741935483870968	2.169	1.911	1.298	1.01	0.8172	0.5391
0.774193548387097	1.875	1.622	1.269	0.9483	0.7955	0.4982
0.806451612903226	1.849	1.617	1.073	0.7687	0.6897	0.4813
0.838709677419355	1.515	1.395	0.9805	0.7112	0.6196	0.4275
0.870967741935484	1.485	1.324	0.8777	0.6541	0.5769	0.3743
0.903225806451613	1.303	1.169	0.8225	0.5739	0.5087	0.3713
0.935483870967742	1.142	1.007	0.7555	0.5577	0.4799	0.3355
0.967741935483871	0.9707	0.9012	0.6547	0.5354	0.4465	0.3317

0.1	8.0642	7.0805	4.6444	3.477	2.8086	1.2919

Average of yearly averages: 0.733873333333333

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: MsBeans
Metfile: w03940.dvf
PRZM scenario: MSsoybeanSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd Kd		mg/L		
Koc Koc	6040	mg/L		
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	4	integer	See PRZM manual	
Incorporation Depth:	DEPI	2.5	cm	
Application Rate:	TAPP	1.1	kg/ha	
Application Efficiency:	APPEFF	0.99	fraction	
Spray Drift	DRFT	0.01	fraction of application rate applied to pond	
Application Date	Date	25-05	dd/mm or dd/mmm or dd-mm or dd-mmm	
Record 17:	FILTRA			
IPSCND	1			
UPTKF				
Record 18:	PLVKRT			
PLDKRT				
FEXTRC	0.5			
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)	

NC Sweet Potatoes

stored as NC sweetpotatos--final.out
Chemical: Chlorpyrifos
PRZM environment: NCSweetPotatoSTD.txt modified Tueday, 29 May 2007 at 13:58:56
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w13722.dvf modified Wedday, 3 July 2002 at 10:05:50
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	7.81	6.869	5.157	3.385	3.462	1.414
1962	24.66	21.61	15.54	12.09	9.922	4.171
1963	33	29.18	22.22	13.61	10.73	4.534
1964	11.79	10.37	6.978	5.986	5.219	3.304
1965	48.78	43.13	32.94	21.2	17.15	6.33
1966	24.53	21.41	14.43	12.31	10.5	4.568
1967	41.22	35.88	24.15	14.28	11.66	4.696
1968	27.33	23.85	15.69	10.74	8.817	3.912
1969	21.62	19.13	14.21	10.92	9.586	4.274
1970	14.22	12.39	8.786	6.147	4.911	2.554
1971	29.85	26.14	17.32	13.17	11.06	4.75
1972	29.05	25.64	17.61	13.43	12.42	5.419
1973	34.07	30.33	23.71	15.21	13.03	5.383
1974	18.08	16.45	12.6	7.935	6.987	3.38
1975	23.32	21.29	14.03	10.46	8.93	3.954
1976	21.58	19.83	16.21	10.88	8.499	3.969
1977	29.28	25.75	16.53	9.447	7.723	4.029
1978	21.42	18.77	13.14	10.25	8.272	3.77
1979	18.41	16.42	11.92	8.448	7.316	3.771
1980	33.58	29.36	18.86	12.46	10.6	4.433
1981	18.78	16.48	12.09	9.359	8.251	3.886
1982	35.14	30.94	23.18	15.3	12.06	4.723
1983	20.83	19	15.26	9.995	7.868	3.448
1984	57.22	49.86	31.13	19.28	15.61	5.8
1985	10.99	9.846	8.038	6.605	6.312	3.324
1986	22.18	19.38	13.43	8.154	7.178	3.855
1987	12.07	10.54	8.784	5.394	4.579	2.853
1988	14.32	12.52	8.619	5.735	4.684	2.755
1989	33.91	29.92	19.84	12.11	10.08	4.158
1990	38.34	33.36	21.02	11.87	9.236	3.802

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly		
0.032258064516129			57.22	49.86	32.94	21.2	17.15	6.33
0.0645161290322581			48.78	43.13	31.13	19.28	15.61	5.8
0.0967741935483871			41.22	35.88	24.15	15.3	13.03	5.419
0.129032258064516			38.34	33.36	23.71	15.21	12.42	5.383
0.161290322580645			35.14	30.94	23.18	14.28	12.06	4.75
0.193548387096774			34.07	30.33	22.22	13.61	11.66	4.723
0.225806451612903			33.91	29.92	21.02	13.43	11.06	4.696
0.258064516129032			33.58	29.36	19.84	13.17	10.73	4.568
0.290322580645161			33	29.18	18.86	12.46	10.6	4.534
0.32258064516129			29.85	26.14	17.61	12.31	10.5	4.433
0.354838709677419			29.28	25.75	17.32	12.11	10.08	4.274
0.387096774193548			29.05	25.64	16.53	12.09	9.922	4.171
0.419354838709677			27.33	23.85	16.21	11.87	9.586	4.158
0.451612903225806			24.66	21.61	15.69	10.92	9.236	4.029
0.483870967741936			24.53	21.41	15.54	10.88	8.93	3.969

0.516129032258065	23.32	21.29	15.26	10.74	8.817	3.954
0.548387096774194	22.18	19.83	14.43	10.46	8.499	3.912
0.580645161290323	21.62	19.38	14.21	10.25	8.272	3.886
0.612903225806452	21.58	19.13	14.03	9.995	8.251	3.855
0.645161290322581	21.42	19	13.43	9.447	7.868	3.802
0.67741935483871	20.83	18.77	13.14	9.359	7.723	3.771
0.709677419354839	18.78	16.48	12.6	8.448	7.316	3.77
0.741935483870968	18.41	16.45	12.09	8.154	7.178	3.448
0.774193548387097	18.08	16.42	11.92	7.935	6.987	3.38
0.806451612903226	14.32	12.52	8.786	6.605	6.312	3.324
0.838709677419355	14.22	12.39	8.784	6.147	5.219	3.304
0.870967741935484	12.07	10.54	8.619	5.986	4.911	2.853
0.903225806451613	11.79	10.37	8.038	5.735	4.684	2.755
0.935483870967742	10.99	9.846	6.978	5.394	4.579	2.554
0.967741935483871	7.81	6.869	5.157	3.385	3.462	1.414

0.1	40.932	35.628	24.106	15.291	12.969	5.4154

Average of yearly averages: 4.04063333333333

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: NC sweetpotatos--final
Metfile: w13722.dvf
PRZM scenario: NCSweetPotatoSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd Kd		mg/L		
Koc Koc	6040	mg/L		
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	1	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	2.2	kg/ha	
Application Efficiency:	APPEFF	0.95	fraction	
Spray Drift	DRFT	0.039	fraction of application rate applied to pond	
Application Date	Date	15-05	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	10	days	Set to 0 or delete line for single app.
app. rate 1	apprate	1.1	kg/ha	
Record 17:	FILTRA			
IPSCND	1			
UPTKF				
Record 18:	PLVKRT			
PLDKRT				
FEXTRC	0.5			
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)	

NC Tobacco
stored as NC Tobacco.out
Chemical: Chlorpyrifos
PRZM environment: NCtobaccoSTD.txt modified Tueday, 29 May 2007 at 13:59:12
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w13722.dvf modified Wedday, 3 July 2002 at 10:05:50
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	3.086	2.633	1.522	0.8865	0.6889	0.2778
1962	3.145	2.697	1.589	1.038	0.9504	0.4414
1963	3.171	2.724	1.616	1.282	1.034	0.4537
1964	3.207	2.751	1.63	1.161	0.9128	0.5209
1965	5.162	4.474	3.274	2.026	1.661	0.6891
1966	3.189	2.735	1.751	1.166	1.059	0.4671
1967	3.581	3.094	2.049	1.164	1.297	0.5174
1968	3.166	2.716	1.603	0.9288	0.7629	0.3486
1969	3.151	2.698	1.583	0.9368	0.7835	0.3976
1970	3.165	2.7	1.595	0.8586	0.6967	0.379
1971	3.159	2.703	1.587	1.075	0.8919	0.3961
1972	3.152	2.703	1.861	1.452	1.312	0.5559
1973	4.492	3.912	2.973	1.755	1.815	0.732
1974	3.195	2.747	1.685	1.4	1.089	0.4533
1975	3.273	2.806	1.656	0.95	0.7484	0.419
1976	3.167	2.723	1.618	1.055	0.8123	0.392
1977	3.19	2.747	1.643	0.9928	0.7673	0.46
1978	14.25	12.24	7.391	4	3.07	1.039
1979	3.199	2.755	1.658	0.9627	0.7751	0.4378
1980	4.317	3.706	2.21	1.173	1.177	0.5167
1981	3.18	2.731	1.62	0.99	0.8603	0.4325
1982	3.871	3.353	2.064	1.229	1.259	0.4765
1983	9.176	7.887	4.669	2.479	1.864	0.6101
1984	4.981	4.292	2.582	1.703	1.457	0.6144
1985	3.178	2.727	1.749	1.095	0.891	0.4243
1986	3.411	2.936	1.862	1.092	0.8682	0.4926
1987	10.1	9.094	5.419	2.71	2.039	0.7921
1988	4.158	3.586	2.467	1.379	1.044	0.4547
1989	3.666	3.15	2.153	1.397	1.121	0.4187
1990	3.135	2.688	1.751	1.307	1.018	0.3641

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.032258064516129	14.25	12.24	7.391	4	3.07	1.039
0.0645161290322581	10.1	9.094	5.419	2.71	2.039	0.7921
0.0967741935483871	9.176	7.887	4.669	2.479	1.864	0.732
0.129032258064516	5.162	4.474	3.274	2.026	1.815	0.6891
0.161290322580645	4.981	4.292	2.973	1.755	1.661	0.6144
0.193548387096774	4.492	3.912	2.582	1.703	1.457	0.6101
0.225806451612903	4.317	3.706	2.467	1.452	1.312	0.5559
0.258064516129032	4.158	3.586	2.21	1.4	1.297	0.5209
0.290322580645161	3.871	3.353	2.153	1.397	1.259	0.5174
0.32258064516129	3.666	3.15	2.064	1.379	1.177	0.5167
0.354838709677419	3.581	3.094	2.049	1.307	1.121	0.4926
0.387096774193548	3.411	2.936	1.862	1.282	1.089	0.4765
0.419354838709677	3.273	2.806	1.861	1.229	1.059	0.4671
0.451612903225806	3.207	2.755	1.751	1.173	1.044	0.46

0.483870967741936	3.199	2.751	1.751	1.166	1.034	0.4547
0.516129032258065	3.195	2.747	1.749	1.164	1.018	0.4537
0.548387096774194	3.19	2.747	1.685	1.161	0.9504	0.4533
0.580645161290323	3.189	2.735	1.658	1.095	0.9128	0.4414
0.612903225806452	3.18	2.731	1.656	1.092	0.8919	0.4378
0.645161290322581	3.178	2.727	1.643	1.075	0.891	0.4325
0.67741935483871	3.171	2.724	1.63	1.055	0.8682	0.4243
0.709677419354839	3.167	2.723	1.62	1.038	0.8603	0.419
0.741935483870968	3.166	2.716	1.618	0.9928	0.8123	0.4187
0.774193548387097	3.165	2.703	1.616	0.99	0.7835	0.3976
0.806451612903226	3.159	2.703	1.603	0.9627	0.7751	0.3961
0.838709677419355	3.152	2.7	1.595	0.95	0.7673	0.392
0.870967741935484	3.151	2.698	1.589	0.9368	0.7629	0.379
0.903225806451613	3.145	2.697	1.587	0.9288	0.7484	0.3641
0.935483870967742	3.135	2.688	1.583	0.8865	0.6967	0.3486
0.967741935483871	3.086	2.633	1.522	0.8586	0.6889	0.2778

0.1	8.7746	7.5457	4.5295	2.4337	1.8591	0.72771	
					Average of yearly averages:		0.499146666666667

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: NC Tobacco
Metfile: w13722.dvf
PRZM scenario: NCtobaccoSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable	Name	Value	Units	Comments
Molecular weight		mwt	350.6	g/mol	
Henry's Law Const.		henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr		1.87e-5	torr	
Solubility	sol		1.4	mg/L	
Kd	Kd			mg/L	
Koc	Koc	6040		mg/L	
Photolysis half-life		kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism		kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism		kbacs	63	days	Halfife
Aerobic Soil Metabolism		asm	109	days	Halfife
Hydrolysis:	pH 7		81	days	Half-life
Method: CAM	4		integer	See PRZM manual	
Incorporation Depth:		DEPI	5.08	cm	
Application Rate:		TAPP	2.2	kg/ha	
Application Efficiency:		APPEFF	0.95	fraction	
Spray Drift	DRFT		0.039	fraction of application rate applied to pond	
Application Date	Date		15-04	dd/mm or dd/mmm or dd-mm or dd-mmm	
Record 17:	FILTRA				
	IPSCND	1			
	UPTKF				
Record 18:	PLVKRT				
	PLDKRT				
	FEXTRC		0.5		
Flag for Index Res. Run		IR	Reservoir		
Flag for runoff calc.		RUNOFF		total	none, monthly or total(average of entire run)

PA Turf

stored as PA Turf_3 day interval at 4.4.out
Chemical: Chlorpyrifos
PRZM environment: PAturfSTD.txt modified Thuday, 23 February 2006 at 18:55:08
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w14751.dvf modified Wedday, 3 July 2002 at 10:06:14
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	126	109	68.07	53.36	42.78	14.45
1962	79.69	69.68	44.42	27.25	24.2	14.47
1963	26.26	22.96	14.77	13.01	11.94	9.505
1964	19.64	18.08	14.2	12.16	10.8	7.333
1965	29.82	26.62	18.13	11.63	9.695	7.068
1966	311	268	163	87.75	69.49	23.6
1967	97.57	89.5	58.93	43.55	35.47	22.3
1968	227	197	121	65.1	50.91	23.18
1969	462	399	290	152	115	42.42
1970	50.4	45.42	35.33	27.58	25.21	17.58
1971	274	237	147	90.07	69.56	25.46
1972	1610	1390	856	453	343	114
1973	228	198	123	69.25	55.03	40.69
1974	80.89	73.96	50.54	40.74	33.32	20.8
1975	513	444	278	149	115	40.49
1976	189	164	104	58.17	47.08	32.32
1977	25.41	25.19	24.36	22.73	21.94	13.1
1978	79.05	69.72	53.44	31.93	24.78	11.01
1979	76.16	66.45	44.47	28.64	22.94	14.93
1980	41.74	36.79	25.27	19.63	14.85	9.743
1981	33.65	29.86	23.76	16.65	14.8	9.655
1982	110	97.23	77.05	52.1	40.61	15.03
1983	60.32	53.52	34.67	14.77	11.6	8.282
1984	54.59	49.04	36.71	30.76	24.89	12.78
1985	51.09	44.49	28.02	16.97	14.34	8.83
1986	152	132	82.58	45.64	36.44	16.18
1987	79.11	69.37	49.16	30.83	27.27	16.42
1988	51.53	44.87	28.18	17.59	15.65	10.57
1989	80.55	71.15	46.94	38.61	33.92	15.92
1990	71.83	63.78	43.15	30.84	27.46	17.04

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.032258064516129	1610	1390	856	453	343	114	
0.0645161290322581	513	444	290	152	115	42.42	
0.0967741935483871	462	399	278	149	115	40.69	
0.129032258064516	311	268	163	90.07	69.56	40.49	
0.161290322580645	274	237	147	87.75	69.49	32.32	
0.193548387096774	228	198	123	69.25	55.03	25.46	
0.225806451612903	227	197	121	65.1	50.91	23.6	
0.258064516129032	189	164	104	58.17	47.08	23.18	
0.290322580645161	152	132	82.58	53.36	42.78	22.3	
0.32258064516129	126	109	77.05	52.1	40.61	20.8	
0.354838709677419	110	97.23	68.07	45.64	36.44	17.58	
0.387096774193548	97.57	89.5	58.93	43.55	35.47	17.04	
0.419354838709677	80.89	73.96	53.44	40.74	33.92	16.42	
0.451612903225806	80.55	71.15	50.54	38.61	33.32	16.18	
0.483870967741936	79.69	69.72	49.16	31.93	27.46	15.92	

0.516129032258065	79.11	69.68	46.94	30.84	27.27	15.03
0.548387096774194	79.05	69.37	44.47	30.83	25.21	14.93
0.580645161290323	76.16	66.45	44.42	30.76	24.89	14.47
0.612903225806452	71.83	63.78	43.15	28.64	24.78	14.45
0.645161290322581	60.32	53.52	36.71	27.58	24.2	13.1
0.67741935483871	54.59	49.04	35.33	27.25	22.94	12.78
0.709677419354839	51.53	45.42	34.67	22.73	21.94	11.01
0.741935483870968	51.09	44.87	28.18	19.63	15.65	10.57
0.774193548387097	50.4	44.49	28.02	17.59	14.85	9.743
0.806451612903226	41.74	36.79	25.27	16.97	14.8	9.655
0.838709677419355	33.65	29.86	24.36	16.65	14.34	9.505
0.870967741935484	29.82	26.62	23.76	14.77	11.94	8.83
0.903225806451613	26.26	25.19	18.13	13.01	11.6	8.282
0.935483870967742	25.41	22.96	14.77	12.16	10.8	7.333
0.967741935483871	19.64	18.08	14.2	11.63	9.695	7.068

0.1	446.9	385.9	266.5	143.107	110.456	40.67

Average of yearly averages: 21.1718666666667

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: PA Turf_3 day interval at 4.4
Metfile: w14751.dvf
PRZM scenario: PAturfSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd Kd		mg/L		
Koc Koc	6040	mg/L		
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	2	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	4.4	kg/ha	
Application Efficiency:	APPEFF	0.99	fraction	
Spray Drift	DRFT	0.01	fraction of application rate applied to pond	
Application Date	Date	09-05	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.
app. rate 1	apprate	4.4	kg/ha	
Interval 2	interval	3	days	Set to 0 or delete line for single app.
app. rate 2	apprate	4.4	kg/ha	
Interval 3	interval	3	days	Set to 0 or delete line for single app.
app. rate 3	apprate	4.4	kg/ha	
Interval 4	interval	3	days	Set to 0 or delete line for single app.
app. rate 4	apprate	4.4	kg/ha	
Interval 5	interval	3	days	Set to 0 or delete line for single app.
app. rate 5	apprate	4.4	kg/ha	
Interval 6	interval	3	days	Set to 0 or delete line for single app.

app. rate 6	apprate	4.4	kg/ha	
Interval 7	interval	3	days	Set to 0 or delete line for single app.
app. rate 7	apprate	4.4	kg/ha	
Interval 8	interval	3	days	Set to 0 or delete line for single app.
app. rate 8	apprate	4.4	kg/ha	
Interval 9	interval	3	days	Set to 0 or delete line for single app.
app. rate 9	apprate	4.4	kg/ha	
Interval 10	interval	3	days	Set to 0 or delete line for single app.
app. rate 10	apprate	4.4	kg/ha	
Interval 11	interval	3	days	Set to 0 or delete line for single app.
app. rate 11	apprate	4.4	kg/ha	
Interval 12	interval	3	days	Set to 0 or delete line for single app.
app. rate 12	apprate	4.4	kg/ha	
Interval 13	interval	3	days	Set to 0 or delete line for single app.
app. rate 13	apprate	4.4	kg/ha	
Interval 14	interval	3	days	Set to 0 or delete line for single app.
app. rate 14	apprate	4.4	kg/ha	
Interval 15	interval	3	days	Set to 0 or delete line for single app.
app. rate 15	apprate	4.4	kg/ha	
Interval 16	interval	3	days	Set to 0 or delete line for single app.
app. rate 16	apprate	4.4	kg/ha	
Interval 17	interval	3	days	Set to 0 or delete line for single app.
app. rate 17	apprate	4.4	kg/ha	
Interval 18	interval	3	days	Set to 0 or delete line for single app.
app. rate 18	apprate	4.4	kg/ha	
Interval 19	interval	3	days	Set to 0 or delete line for single app.
app. rate 19	apprate	4.4	kg/ha	
Interval 20	interval	3	days	Set to 0 or delete line for single app.
app. rate 20	apprate	4.4	kg/ha	
Interval 21	interval	3	days	Set to 0 or delete line for single app.
app. rate 21	apprate	4.4	kg/ha	
Interval 22	interval	3	days	Set to 0 or delete line for single app.
app. rate 22	apprate	4.4	kg/ha	
Interval 23	interval	3	days	Set to 0 or delete line for single app.
app. rate 23	apprate	4.4	kg/ha	
Interval 24	interval	3	days	Set to 0 or delete line for single app.
app. rate 24	apprate	4.4	kg/ha	
Interval 25	interval	3	days	Set to 0 or delete line for single app.
app. rate 25	apprate	4.4	kg/ha	
Record 17:	FILTRA			
	IPSCND1			
	UPTKF			
Record 18:	PLVKRT			
	PLDKRT			
	FEXTRC	0.5		
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF		total	none, monthly or total(average of entire run)

PA Turf alternative scenario (2 lbs ai/a)

stored as PA Turf_3 day interval at 2.2.out
Chemical: Chlorpyrifos
PRZM environment: PAturfSTD.txt modified Thuday, 23 February 2006 at 18:55:08
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w14751.dvf modified Wedday, 3 July 2002 at 10:06:14
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	62.96	54.72	34.04	26.68	21.39	7.226
1962	39.84	34.84	22.21	13.62	12.1	7.233
1963	13.13	11.48	7.384	6.504	5.969	4.752
1964	9.818	9.04	7.099	6.08	5.401	3.666
1965	14.91	13.31	9.063	5.813	4.848	3.534
1966	155	134	81.47	43.87	34.75	11.8
1967	48.79	44.75	29.46	21.77	17.74	11.15
1968	113	98.32	60.35	32.56	25.46	11.59
1969	231	199	145	75.88	57.41	21.2
1970	25.2	22.71	17.66	13.79	12.61	8.79
1971	137	119	73.57	45.03	34.77	12.73
1972	807	697	428	227	171	57.1
1973	114	98.98	61.48	34.63	27.52	20.35
1974	40.46	36.99	25.27	20.38	16.67	10.4
1975	257	222	139	74.6	57.75	20.25
1976	94.51	82.05	51.89	29.08	23.54	16.16
1977	12.7	12.6	12.18	11.37	10.97	6.552
1978	39.53	34.86	26.72	15.97	12.39	5.507
1979	38.08	33.22	22.23	14.32	11.47	7.464
1980	20.87	18.4	12.64	9.813	7.424	4.871
1981	16.82	14.93	11.88	8.326	7.401	4.827
1982	55.12	48.62	38.52	26.05	20.3	7.514
1983	30.16	26.76	17.34	7.384	5.798	4.141
1984	27.3	24.52	18.36	15.38	12.44	6.391
1985	25.55	22.25	14.01	8.485	7.169	4.415
1986	76.06	66.19	41.29	22.82	18.22	8.092
1987	39.56	34.69	24.58	15.42	13.64	8.209
1988	25.76	22.44	14.09	8.797	7.827	5.283
1989	40.28	35.58	23.47	19.3	16.96	7.957
1990	35.91	31.89	21.57	15.42	13.73	8.518

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.032258064516129		807	697	428	227	171	57.1
0.0645161290322581		257	222	145	75.88	57.75	21.2
0.0967741935483871		231	199	139	74.6	57.41	20.35
0.129032258064516		155	134	81.47	45.03	34.77	20.25
0.161290322580645		137	119	73.57	43.87	34.75	16.16
0.193548387096774		114	98.98	61.48	34.63	27.52	12.73
0.225806451612903		113	98.32	60.35	32.56	25.46	11.8
0.258064516129032		94.51	82.05	51.89	29.08	23.54	11.59
0.290322580645161		76.06	66.19	41.29	26.68	21.39	11.15
0.32258064516129		62.96	54.72	38.52	26.05	20.3	10.4
0.354838709677419		55.12	48.62	34.04	22.82	18.22	8.79
0.387096774193548		48.79	44.75	29.46	21.77	17.74	8.518
0.419354838709677		40.46	36.99	26.72	20.38	16.96	8.209
0.451612903225806		40.28	35.58	25.27	19.3	16.67	8.092
0.483870967741936		39.84	34.86	24.58	15.97	13.73	7.957
0.516129032258065		39.56	34.84	23.47	15.42	13.64	7.514
0.548387096774194		39.53	34.69	22.23	15.42	12.61	7.464
0.580645161290323		38.08	33.22	22.21	15.38	12.44	7.233
0.612903225806452		35.91	31.89	21.57	14.32	12.39	7.226
0.645161290322581		30.16	26.76	18.36	13.79	12.1	6.552
0.67741935483871		27.3	24.52	17.66	13.62	11.47	6.391
0.709677419354839		25.76	22.71	17.34	11.37	10.97	5.507

0.741935483870968	25.55	22.44	14.09	9.813	7.827	5.283
0.774193548387097	25.2	22.25	14.01	8.797	7.424	4.871
0.806451612903226	20.87	18.4	12.64	8.485	7.401	4.827
0.838709677419355	16.82	14.93	12.18	8.326	7.169	4.752
0.870967741935484	14.91	13.31	11.88	7.384	5.969	4.415
0.903225806451613	13.13	12.6	9.063	6.504	5.798	4.141
0.935483870967742	12.7	11.48	7.384	6.08	5.401	3.666
0.967741935483871	9.818	9.04	7.099	5.813	4.848	3.534

0.1	223.4	192.5	133.247	71.643	55.146	20.34	
					Average of yearly averages:		10.5890666666667

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: PA Turf_3 day interval at 2.2
Metfile: w14751.dvf
PRZM scenario: PAturfSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd Kd	Kd		mg/L	
Koc Koc	Koc	6040	mg/L	
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	2	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	2.2	kg/ha	
Application Efficiency:	APPEFF	0.99	fraction	
Spray Drift	DRFT	0.01	fraction of application rate applied to pond	
Application Date	Date	09-05	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.
app. rate 1	apprate	2.2	kg/ha	
Interval 2	interval	3	days	Set to 0 or delete line for single app.
app. rate 2	apprate	2.2	kg/ha	
Interval 3	interval	3	days	Set to 0 or delete line for single app.
app. rate 3	apprate	2.2	kg/ha	
Interval 4	interval	3	days	Set to 0 or delete line for single app.
app. rate 4	apprate	2.2	kg/ha	
Interval 5	interval	3	days	Set to 0 or delete line for single app.
app. rate 5	apprate	2.2	kg/ha	
Interval 6	interval	3	days	Set to 0 or delete line for single app.
app. rate 6	apprate	2.2	kg/ha	
Interval 7	interval	3	days	Set to 0 or delete line for single app.
app. rate 7	apprate	2.2	kg/ha	
Interval 8	interval	3	days	Set to 0 or delete line for single app.
app. rate 8	apprate	2.2	kg/ha	
Interval 9	interval	3	days	Set to 0 or delete line for single app.
app. rate 9	apprate	2.2	kg/ha	

Interval 10	interval	3	days	Set to 0 or delete line for single app.
app. rate 10	apprate	2.2	kg/ha	
Interval 11	interval	3	days	Set to 0 or delete line for single app.
app. rate 11	apprate	2.2	kg/ha	
Interval 12	interval	3	days	Set to 0 or delete line for single app.
app. rate 12	apprate	2.2	kg/ha	
Interval 13	interval	3	days	Set to 0 or delete line for single app.
app. rate 13	apprate	2.2	kg/ha	
Interval 14	interval	3	days	Set to 0 or delete line for single app.
app. rate 14	apprate	2.2	kg/ha	
Interval 15	interval	3	days	Set to 0 or delete line for single app.
app. rate 15	apprate	2.2	kg/ha	
Interval 16	interval	3	days	Set to 0 or delete line for single app.
app. rate 16	apprate	2.2	kg/ha	
Interval 17	interval	3	days	Set to 0 or delete line for single app.
app. rate 17	apprate	2.2	kg/ha	
Interval 18	interval	3	days	Set to 0 or delete line for single app.
app. rate 18	apprate	2.2	kg/ha	
Interval 19	interval	3	days	Set to 0 or delete line for single app.
app. rate 19	apprate	2.2	kg/ha	
Interval 20	interval	3	days	Set to 0 or delete line for single app.
app. rate 20	apprate	2.2	kg/ha	
Interval 21	interval	3	days	Set to 0 or delete line for single app.
app. rate 21	apprate	2.2	kg/ha	
Interval 22	interval	3	days	Set to 0 or delete line for single app.
app. rate 22	apprate	2.2	kg/ha	
Interval 23	interval	3	days	Set to 0 or delete line for single app.
app. rate 23	apprate	2.2	kg/ha	
Interval 24	interval	3	days	Set to 0 or delete line for single app.
app. rate 24	apprate	2.2	kg/ha	
Interval 25	interval	3	days	Set to 0 or delete line for single app.
app. rate 25	apprate	2.2	kg/ha	
Record 17:	FILTRA			
	IPSCND1			
	UPTKF			
Record 18:	PLVKRT			
	PLDKRT			
	FEXTRC	0.5		
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)	

PA Turf alternative scenario (applications specifically listed on label)

stored as PA Turf_eg.out
Chemical: Chlorpyrifos
PRZM environment: PAturfSTD.txt modified Thuday, 23 February 2006 at 18:55:08
EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12
Metfile: w14751.dvf modified Wedday, 3 July 2002 at 10:06:14
Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	11.01	10.21	6.646	4.185	3.472	1.201
1962	13.27	11.57	7.287	4.39	3.875	1.832
1963	4.441	3.887	2.508	2.105	1.861	1.459
1964	3.751	3.282	2.228	1.606	1.417	1.106
1965	4.935	4.408	3.005	1.93	1.639	1.068
1966	45.83	39.59	24.08	13.01	10.31	3.551

1967	9.817	8.984	6.059	4.11	3.692	2.794
1968	39.9	34.59	21.28	11.52	9.026	3.698
1969	22.51	20.53	14.88	8.216	6.299	3.246
1970	3.228	2.869	2.31	2.007	1.878	1.496
1971	25.93	22.45	13.93	9.405	7.291	2.759
1972	128	111	67.23	35.36	26.93	9.515
1973	41.41	35.94	22.21	12.4	9.819	5.176
1974	13.71	12.8	8.584	5.833	4.859	3.208
1975	92.12	79.72	49.95	26.9	20.85	6.607
1976	35.9	31.19	19.78	11.16	9.032	5.703
1977	4.961	4.921	4.76	4.445	4.263	2.407
1978	5.237	4.606	3.55	2.408	2.105	1.267
1979	13.75	12	8.018	5.212	4.164	2.33
1980	7.437	6.567	4.54	3.539	2.689	1.657
1981	3.565	3.159	2.424	2.111	2.007	1.425
1982	17.91	15.62	11.64	6.994	5.558	2.21
1983	9.631	8.56	5.592	2.689	2.209	1.501
1984	9.941	8.731	5.845	3.862	3.27	1.966
1985	8.837	7.705	4.881	2.981	2.528	1.519
1986	15.82	13.77	8.599	5.078	3.997	2.024
1987	13.41	11.74	8.42	5.21	4.581	2.346
1988	3.368	2.965	2.373	2.224	2.042	1.424
1989	8.421	7.387	5.387	3.609	3.387	1.991
1990	13.94	12.15	7.603	4.36	3.846	2.575

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly	
0.032258064516129		128	111	67.23	35.36	26.93	9.515
0.0645161290322581		92.12	79.72	49.95	26.9	20.85	6.607
0.0967741935483871		45.83	39.59	24.08	13.01	10.31	5.703
0.129032258064516		41.41	35.94	22.21	12.4	9.819	5.176
0.161290322580645		39.9	34.59	21.28	11.52	9.032	3.698
0.193548387096774		35.9	31.19	19.78	11.16	9.026	3.551
0.225806451612903		25.93	22.45	14.88	9.405	7.291	3.246
0.258064516129032		22.51	20.53	13.93	8.216	6.299	3.208
0.290322580645161		17.91	15.62	11.64	6.994	5.558	2.794
0.32258064516129		15.82	13.77	8.599	5.833	4.859	2.759
0.354838709677419		13.94	12.8	8.584	5.212	4.581	2.575
0.387096774193548		13.75	12.15	8.42	5.21	4.263	2.407
0.419354838709677		13.71	12	8.018	5.078	4.164	2.346
0.451612903225806		13.41	11.74	7.603	4.445	3.997	2.33
0.483870967741936		13.27	11.57	7.287	4.39	3.875	2.21
0.516129032258065		11.01	10.21	6.646	4.36	3.846	2.024
0.548387096774194		9.941	8.984	6.059	4.185	3.692	1.991
0.580645161290323		9.817	8.731	5.845	4.11	3.472	1.966
0.612903225806452		9.631	8.56	5.592	3.862	3.387	1.832
0.645161290322581		8.837	7.705	5.387	3.609	3.27	1.657
0.67741935483871		8.421	7.387	4.881	3.539	2.689	1.519
0.709677419354839		7.437	6.567	4.76	2.981	2.528	1.501
0.741935483870968		5.237	4.921	4.54	2.689	2.209	1.496
0.774193548387097		4.961	4.606	3.55	2.408	2.105	1.459
0.806451612903226		4.935	4.408	3.005	2.224	2.042	1.425
0.838709677419355		4.441	3.887	2.508	2.111	2.007	1.424
0.870967741935484		3.751	3.282	2.424	2.105	1.878	1.267
0.903225806451613		3.565	3.159	2.373	2.007	1.861	1.201
0.935483870967742		3.368	2.965	2.31	1.93	1.639	1.106

0.967741935483871			3.228	2.869	2.228	1.606	1.417	1.068

0.1	45.388	39.225	23.893	12.949	10.2609	5.6503

Average of yearly averages: 2.70203333333333

Inputs generated by pe5.pl - Novemeber 2006

Data used for this run:
Output File: PA Turf_eg
Metfile: w14751.dvf
PRZM scenario: PAturfSTD.txt
EXAMS environment file: ir298.exv
Chemical Name: Chlorpyrifos

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	350.6	g/mol	
Henry's Law Const.	henry	6.2e-6	atm-m^3/mol	
Vapor Pressure	vapr	1.87e-5	torr	
Solubility	sol	1.4	mg/L	
Kd	Kd		mg/L	
Koc	Koc	6040	mg/L	
Photolysis half-life	kdp	29.6	days	Half-life
Aerobic Aquatic Metabolism	kbacw	91.5	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	63	days	Halfife
Aerobic Soil Metabolism	asm	109	days	Halfife
Hydrolysis:	pH 7	81	days	Half-life
Method: CAM	2	integer	See PRZM manual	
Incorporation Depth:	DEPI	0	cm	
Application Rate:	TAPP	2.2	kg/ha	
Application Efficiency:	APPEFF	0.99	fraction	
Spray Drift	DRFT	0.01	fraction of application rate applied to pond	
Application Date	Date	15-04	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	30	days	Set to 0 or delete line for single app.
app. rate 1	apprate	2.2	kg/ha	
Interval 2	interval	7	days	Set to 0 or delete line for single app.
app. rate 2	apprate	1.1	kg/ha	
Interval 3	interval	7	days	Set to 0 or delete line for single app.
app. rate 3	apprate	1.1	kg/ha	
Interval 4	interval	60	days	Set to 0 or delete line for single app.
app. rate 4	apprate	4.4	kg/ha	
Interval 5	interval	30	days	Set to 0 or delete line for single app.
app. rate 5	apprate	4.4	kg/ha	
Record 17:	FILTRA			
	IPSCND	1		
	UPTKF			
Record 18:	PLVKRT			
	PLDKRT			
	FEXTRC	0.5		
Flag for Index Res. Run	IR	Reservoir		
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)	

APPENDIX B

SCI-GROW Output Files

SCIGROW VERSION 2.3
CHEMICAL:CHLORPYRIFOS
TIME IS 4/ 6/2011 12:21: 2

APPLICATION RATE (LB/ACRE)	NUMBER OF APPLICATIONS	TOTAL USE (LB/ACRE/YR)	KOC (ML/G)	SOIL AEROBIC METABOLISM (DAYS)
1.000	1.0	1.000	5.86E+03	68.0

GROUNDWATER SCREENING COND (PPB) = 1.03E-02

****

SCIGROW VERSION 2.3
CHEMICAL:CHLORPYRIFOS
TIME IS 4/13/2011 17:23:41

APPLICATION RATE (LB/ACRE)	NUMBER OF APPLICATIONS	TOTAL USE (LB/ACRE/YR)	KOC (ML/G)	SOIL AEROBIC METABOLISM (DAYS)
1.500	1.0	1.500	5.86E+03	68.0

GROUNDWATER SCREENING COND (PPB) = 1.55E-02

****

SCIGROW VERSION 2.3
CHEMICAL:CHLORPYRIFOS
TIME IS 4/13/2011 17:23:55

APPLICATION RATE (LB/ACRE)	NUMBER OF APPLICATIONS	TOTAL USE (LB/ACRE/YR)	KOC (ML/G)	SOIL AEROBIC METABOLISM (DAYS)
2.000	1.0	2.000	5.86E+03	68.0

GROUNDWATER SCREENING COND (PPB) = 2.06E-02
****

SCIGROW VERSION 2.3
CHEMICAL:CHLORPYRIFOS
TIME IS 4/ 6/2011 8:30:25

APPLICATION RATE (LB/ACRE)	NUMBER OF APPLICATIONS	TOTAL USE (LB/ACRE/YR)	KOC (ML/G)	SOIL AEROBIC METABOLISM (DAYS)
3.000	1.0	3.000	5.86E+03	68.0

GROUNDWATER SCREENING COND (PPB) = 3.09E-02
****

SCIGROW VERSION 2.3
CHEMICAL:CHLORPYRIFOS
TIME IS 4/ 7/2011 14:37:37

```
 APPLICATION     NUMBER OF      TOTAL USE    KOC     SOIL AEROBIC
 RATE (LB/ACRE)  APPLICATIONS   (LB/ACRE/YR)  (ML/G)   METABOLISM (DAYS)
-------------------------------------------------------------------
    4.000         1.0          4.000     5.86E+03      68.0
-------------------------------------------------------------------
GROUNDWATER SCREENING COND (PPB) =   4.12E-02
*******************************************************************************

 SCIGROW VERSION 2.3
 CHEMICAL:CHLORPYRIFOS-
 TIME IS  4/ 7/2011  13:20:44
-------------------------------------------------------------------
 APPLICATION     NUMBER OF      TOTAL USE    KOC     SOIL AEROBIC
 RATE (LB/ACRE)  APPLICATIONS   (LB/ACRE/YR)  (ML/G)   METABOLISM (DAYS)
-------------------------------------------------------------------
    2.000         2.0          4.000     5.86E+03      68.0
-------------------------------------------------------------------
 GROUNDWATER SCREENING COND (PPB) =   4.12E-02
*******************************************************************************
SCIGROW VERSION 2.3
 CHEMICAL:CHLORPYRIFOS-
 TIME IS  4/ 7/2011  12:59:49
-------------------------------------------------------------------
 APPLICATION     NUMBER OF      TOTAL USE    KOC     SOIL AEROBIC
 RATE (LB/ACRE)  APPLICATIONS   (LB/ACRE/YR)  (ML/G)   METABOLISM (DAYS)
-------------------------------------------------------------------
    2.000         3.0          6.000     5.86E+03      68.0
-------------------------------------------------------------------
 GROUNDWATER SCREENING COND (PPB) =   6.19E-02
*******************************************************************************

SCIGROW VERSION 2.3
 CHEMICAL:CHLORPYRIFOS
 TIME IS  4/ 7/2011  14:47:49
-------------------------------------------------------------------
 APPLICATION     NUMBER OF      TOTAL USE    KOC     SOIL AEROBIC
 RATE (LB/ACRE)  APPLICATIONS   (LB/ACRE/YR)  (ML/G)   METABOLISM (DAYS)
-------------------------------------------------------------------
    9.000         1.0          9.000     5.86E+03      68.0
-------------------------------------------------------------------
 GROUNDWATER SCREENING COND (PPB) =   9.28E-02
*******************************************************************************

SCIGROW VERSION 2.3
 CHEMICAL:CHLORPYRIFOS
 TIME IS  4/13/2011  14:37: 0
-------------------------------------------------------------------
 APPLICATION     NUMBER OF      TOTAL USE    KOC     SOIL AEROBIC
 RATE (LB/ACRE)  APPLICATIONS   (LB/ACRE/YR)  (ML/G)   METABOLISM (DAYS)
-------------------------------------------------------------------
   10.000         1.0          10.000    5.86E+03      68.0
-------------------------------------------------------------------
 GROUNDWATER SCREENING COND (PPB) =   1.03E-01
*******************************************************************************

 SCIGROW VERSION 2.3
```

CHEMICAL:CHLORPYRIFOS
TIME IS 4/ 6/2011 8:36: 5

APPLICATION RATE (LB/ACRE)	NUMBER OF APPLICATIONS	TOTAL USE (LB/ACRE/YR)	KOC (ML/G)	SOIL AEROBIC METABOLISM (DAYS)
12.000	1.0	12.000	5.86E+03	68.0

GROUNDWATER SCREENING COND (PPB) = 1.24E-01

SCIGROW VERSION 2.3
CHEMICAL:CHLORPYRIFOS
TIME IS 4/ 6/2011 14:54:13

APPLICATION RATE (LB/ACRE)	NUMBER OF APPLICATIONS	TOTAL USE (LB/ACRE/YR)	KOC (ML/G)	SOIL AEROBIC METABOLISM (DAYS)
33.300	1.0	33.300	5.86E+03	68.0

GROUNDWATER SCREENING COND (PPB) = 3.43E-01

APPENDIX C

Water Monitoring Data for Chlorpyrifos and Chlorpyrifos-oxon

Table C1. Qualified (actual or estimated) Detections of Chlorpyrifos in Surface Water. Data from United States Geological Survey National Water Quality Assessment (USGS NAWQA) accessed May 21, 2010. Data was previously reported (DP 059101).

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
BIBB	AL	02424000	Mixed	1999	10
					0.008926
					0.0246
				2000	7
					0.008267
					0.0151
				2001	2
					0.003375
					0.00483
CALHOUN	AL	02401749	Urban	2001	1
					0.00567
					0.00567
		02403380	Urban	2001	1
					0.00866
					0.00866
CHOCTAW	AL	02469762	Mixed	1999	1
					0.00678
					0.00678
				2000	1
					0.00331
					0.00331
				2004	1
					0.0098
					0.0098
JEFFERSON	AL	02423515	Urban	2001	2
					0.005725
					0.00925
		02423590	Urban	2000	1
					0.0116
					0.0116
				2001	1
					0.00817
					0.00817
		02456900	Urban	2001	1
					0.00311
					0.00311

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
		02461200	Urban	2001	1
					0.00744
					0.00744
MADISON	AL	0357479650	Cropland	2000	1
					0.0151
					0.0151
		03575100	Mixed	2000	2
					0.009925
					0.0151
				2001	1
					0.0056
					0.0056
				2002	1
					0.0041
					0.0041
MONROE	AL	02429500	Mixed	2000	1
					0.00529
					0.00529
MONTGOMERY	AL	02419977	Not Applicable	1999	10
					0.018106
					0.068
				2000	9
					0.016876
					0.0654
				2001	9
					0.02042
					0.127
PICKENS	AL	02444490	Cropland	1999	9
					0.066909
					0.213
				2000	3
					0.084267
					0.211
				2001	2
					0.0058
					0.0063
				2002	2
					0.03495
					0.0648
				2003	2
					0.02595
					0.0352
				2004	2
					0.01475
					0.0258

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
SHELBY	AL	0242354750	Urban	1999	10
					0.003841
					0.00562
				2000	7
					0.005144
					0.0112
				2001	4
					0.010703
					0.0299
				2002	1
					0.0114
					0.0114
				2003	1
					0.0024
					0.0024
				2004	1
					0.0046
					0.0046
				2005	4
					0.005725
					0.0106
				2006	1
					0.0104
					0.0104
				2009	1
					0.0047
					0.0047
ST	AL	0242339580	Urban	2000	1
					0.00264
					0.00264
				2001	1
					0.0111
					0.0111
CARROLL	AR	07050500	Mixed	1995	1
					0.003
					0.003
PULASKI	AR	07263620	Not Applicable	1995	1
					0.005
					0.005
				1996	2
					0.0048
					0.005
				1998	1
					0.00336
					0.00336

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				2000	1
					0.0035
					0.0035
MARICOPA	AZ	09513990	Mixed	1996	2
					0.0245
					0.033
		09514100	Agriculture	1998	1
					0.00752
					0.00752
		09517000	Agriculture	1996	3
					0.021033
					0.0221
				1997	30
					0.036389
					0.154
				1998	4
					0.01187
					0.0195
				2009	3
					0.007433
					0.0084
SANTA	AZ	09481740	Urban	2009	1
					0.0037
					0.0037
YUMA	AZ	09522000	Not Applicable	1996	1
					0.0048
					0.0048
				2009	2
					0.0068
					0.0087
IMPERIAL	CA	09429490	Not Applicable	1996	2
					0.0058
					0.0088
				1997	1
					0.0025
					0.0025
				2000	1
					0.00498
					0.00498
MERCED	CA	11260815	Mixed	2000	14
					0.011286
					0.0734
				2001	15
					0.005377
					0.014

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
		11261100	Agriculture	1993	17
					0.019824
					0.052
				2001	8
					0.070598
					0.4
		11262900	Agriculture	1999	1
					0.016
					0.016
				2001	19
					0.00663
					0.0256
		11273500	Mixed	1993	30
					0.0378
					0.26
				1994	17
					0.038412
					0.097
				1997	7
					0.00644
					0.0107
				1998	5
					0.005566
					0.00974
				1999	2
					0.004055
					0.00455
				2000	20
					0.006628
					0.0151
				2001	30
					0.006772
					0.0254
				2002	5
					0.00424
					0.0066
				2003	6
					0.008333
					0.0151
				2004	3
					0.015467
					0.0206
				2005	5
					0.00548
					0.0068

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				2006	3
					0.0054
					0.0069
				2008	2
					0.0053
					0.0063
				2009	9
					0.006844
					0.0127
		371521120390800	Mixed	1994	1
					0.003
					0.003
				2000	1
					0.00406
					0.00406
				2001	1
					0.0185
					0.0185
		371903120585400	Agriculture	2000	7
					0.016894
					0.0373
				2001	2
					0.01305
					0.0135
		372323120481700	Agriculture	1994	2
					0.23
					0.24
				2000	10
					0.006421
					0.0111
				2001	1
					0.003
					0.003
				2002	1
					0.0071
					0.0071
				2004	3
					0.104533
					0.13
		372424120432800	Mixed	1994	2
					0.048
					0.048
				2000	10
					0.007988
					0.0117

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				2001	1
					0.0051
					0.0051
		372829120420801	Not Applicable	2002	4
					0.0047
					0.0056
		372839120413901	Not Applicable	2004	17
					0.093835
					0.3
		373012120393401	Not Applicable	2002	3
					0.0059
					0.0074
		373020120385201	Not Applicable	2003	1
					0.0287
					0.0287
		373112120382901	Not Applicable	2002	4
					0.024775
					0.0676
				2003	3
					0.008567
					0.0097
				2004	15
					0.056893
					0.143
		373115120382801	Not Applicable	2002	1
					0.0072
					0.0072
				2003	13
					0.009592
					0.0188
				2004	9
					0.033744
					0.0527
ORANGE	CA	11075610	Mixed	1998	1
					0.00228
					0.00228
				1999	7
					0.022401
					0.0568
				2000	7
					0.032006
					0.129
				2001	2
					0.005355
					0.00608

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
RIVERSIDE	CA	11074000	Mixed	2001	2
					0.006925
					0.008
				2008	1
					0.0146
					0.0146
SACRAMENTO	CA	11447360	Urban	1996	2
					0.03125
					0.0358
				1997	18
					0.013972
					0.0445
				1998	2
					0.02395
					0.0242
				2001	6
					0.005775
					0.00857
				2002	3
					0.0095
					0.016
				2003	5
					0.01028
					0.0224
				2004	6
					0.009433
					0.0213
				2005	10
					0.00997
					0.0238
				2006	3
					0.0067
					0.0092
				2008	6
					0.007517
					0.009
		11447650	Mixed	1997	1
					0.0032
					0.0032
				2000	2
					0.004525
					0.00585
				2002	1
					0.0038
					0.0038

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				2003	1
					0.0037
					0.0037
				2004	3
					0.007433
					0.0118
				2005	6
					0.006417
					0.0084
				2006	8
					0.005113
					0.0065
				2007	6
					0.00425
					0.0066
				2008	5
					0.00402
					0.0044
				2009	2
					0.0058
					0.0087
SAN	CA	11060400	Urban	1998	1
					0.00226
					0.00226
				1999	4
					0.016153
					0.0456
				2000	3
					0.004807
					0.00528
		11073495	Urban	1999	1
					0.0356
					0.0356
		335910117425801	Residential	2000	1
					0.0123
					0.0123
SAN	CA	11303500	Mixed	1992	16
					0.0105
					0.016
				1993	18
					0.016722
					0.033
				1994	24
					0.012708
					0.029

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				1995	4
					0.01625
					0.026
				1997	6
					0.00947
					0.0142
				1998	3
					0.005023
					0.00699
				1999	1
					0.00564
					0.00564
				2000	35
					0.006595
					0.0174
				2001	43
					0.00587
					0.0122
				2002	15
					0.01016
					0.0361
				2003	10
					0.00832
					0.0225
				2004	6
					0.014167
					0.055
				2005	2
					0.00685
					0.0093
				2006	4
					0.0052
					0.0062
				2007	19
					0.005684
					0.0092
				2008	16
					0.008075
					0.0178
				2009	12
					0.006425
					0.0092
				2010	1
					0.0064
					0.0064

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
STANISLAUS	CA	11274538	Agriculture	1992	46
					0.034457
					0.3
				1993	26
					0.038192
					0.14
				1994	1
					0.27
					0.27
				1995	1
					0.086
					0.086
				1997	9
					0.02871
					0.112
				1998	9
					0.022456
					0.068
				1999	5
					0.023286
					0.0416
				2000	21
					0.017058
					0.179
				2001	32
					0.020397
					0.149
				2002	11
					0.019118
					0.0484
				2003	10
					0.02871
					0.116
				2004	5
					0.00946
					0.0194
				2005	4
					0.0116
					0.0264
				2006	4
					0.028225
					0.067
				2009	1
					0.0118
					0.0118

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				2010	2
					0.0052
					0.0052
		11274554	Agriculture	1994	1
					0.029
					0.029
				2001	2
					0.0077
					0.0085
		11274560	Agriculture	1992	20
					0.0265
					0.06
				1993	1
					0.029
					0.029
				1994	1
					0.014
					0.014
				1999	1
					0.0049
					0.0049
				2000	8
					0.008464
					0.0126
				2001	2
					0.00985
					0.0121
		11274570	Mixed	1994	5
					0.0146
					0.03
				2000	1
					0.00741
					0.00741
				2001	22
					0.005081
					0.0108
		11274653	Agriculture	1994	1
					0.037
					0.037
				2000	5
					0.006722
					0.0091
				2001	13
					0.027608
					0.12

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
		11290000	Mixed	1993	1
					0.003
					0.003
				1994	17
					0.013824
					0.032
				1995	1
					0.008
					0.008
		11290200	Mixed	1994	1
					0.013
					0.013
				2000	17
					0.006079
					0.0176
				2001	32
					0.007323
					0.0208
		11290500	Mixed	2001	14
					0.007141
					0.0146
		11303000	Mixed	1994	1
					0.015
					0.015
		373027121051401	Agriculture	1994	1
					0.27
					0.27
				2001	2
					0.007
					0.0075
		373232121053900	Agriculture	1994	1
					0.015
					0.015
				2001	1
					0.0152
					0.0152
		373621121102801	Mixed	1994	4
					0.0115
					0.02
				2001	2
					0.0074
					0.009
		373632121014701	Mixed	1995	6
					0.006
					0.01

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
		373639120551001	Agriculture	1995	1
					0.021
					0.021
		373731120595401	Urban	1995	1
					0.031
					0.031
		373747121125200	Agriculture	1994	1
					0.007
					0.007
				2001	1
					0.0212
					0.0212
		373749120593701	Urban	1995	1
					0.05
					0.05
		373753120441101	Agriculture	1995	1
					0.007
					0.007
		373811120590001	Urban	1995	6
					0.058667
					0.093
				2000	7
					0.008403
					0.0204
		373842121131800	Agriculture	1994	1
					0.02
					0.02
		373847120590801	Urban	1995	6
					0.069833
					0.079
				2001	9
					0.026071
					0.0352
		373910120570601	Urban	1995	1
					0.25
					0.25
		373925120550701	Agriculture	1995	3
					0.005
					0.006
				2000	12
					0.00685
					0.0253
		373927120551301	Urban	1995	1
					0.3
					0.3

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
		374024120462401	Agriculture	1995	1
					0.008
					0.008
		374111121000301	Not Applicable	2005	1
					0.0185
					0.0185
		374115120591601	Not Applicable	2005	1
					0.0222
					0.0222
		374209121103800	Mixed	2000	15
					0.005366
					0.00962
				2001	28
					0.010495
					0.0998
SUTTER	CA	11391100	Cropland	2001	1
					0.00154
					0.00154
				2002	1
					0.0111
					0.0111
				2003	1
					0.0096
					0.0096
				2004	2
					0.0174
					0.0192
YOLO	CA	11390890	Cropland	1997	6
					0.011797
					0.0164
ADAMS	CO	06720500	Not Applicable	1994	2
					0.0065
					0.007
BOULDER	CO	400855105090501	Not Applicable	2003	1
					0.0066
					0.0066
DENVER	CO	06713500	Urban	1993	9
					0.055667
					0.3
				1994	6
					0.098167
					0.34
				2008	1
					0.0057
					0.0057

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				2009	2
					0.00635
					0.0071
		06714000	Urban	1994	5
					0.0414
					0.11
				1998	1
					0.0045
					0.0045
				1999	1
					0.00896
					0.00896
MESA	CO	09153290	Agriculture	1997	13
					0.005778
					0.0131
				1998	1
					0.00288
					0.00288
		09163500	Mixed	1997	2
					0.003115
					0.00326
				2000	1
					0.0077
					0.0077
				2004	1
					0.0038
					0.0038
MONTROSE	CO	09149480	Agriculture	1997	2
					0.00372
					0.00379
WELD	CO	06721000	Mixed	1994	1
					0.008
					0.008
		06731000	Mixed	2001	1
					0.0091
					0.0091
		06744000	Mixed	1994	1
					0.035
					0.035
				2001	1
					0.0021
					0.0021
		06753990	Agriculture	1993	6
					0.051167
					0.22

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				1994	3
					0.014
					0.02
				2001	1
					0.0151
					0.0151
				2003	2
					0.00425
					0.0049
		06754000	Mixed	1997	1
					0.00171
					0.00171
				1998	2
					0.0274
					0.0491
				2000	1
					0.00312
					0.00312
				2002	1
					0.0172
					0.0172
				2003	1
					0.0045
					0.0045
		401910104483900	Mixed	1994	1
					0.005
					0.005
		402238104402500	Mixed	1994	1
					0.008
					0.008
FAIRFIELD	CT	01209710	Urban	1997	2
					0.0034
					0.00355
				2002	1
					0.0048
					0.0048
HARTFORD	CT	01184000	Mixed	1994	1
					0.014
					0.014
				1997	1
					0.00276
					0.00276
				2000	1
					0.00238
					0.00238

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				2008	2
					0.0053
					0.0056
		01189000	Urban	1994	1
					0.026
					0.026
NEW	CT	01208500	Mixed	1994	3
					0.007333
					0.009
DISTRICT	DC	01648010	Not Applicable	2000	4
					0.005708
					0.00816
DE	FL	02296750	Mixed	2001	1
					0.004
					0.004
HILLSBOROUGH	FL	02306647	Urban	1994	1
					0.017
					0.017
LEON	FL	02326838	Urban	1993	9
					0.012667
					0.028
				1994	22
					0.010541
					0.018
				1995	3
					0.009533
					0.0127
		02329000	Mixed	1994	25
					0.00368
					0.006
MIAMI-DADE	FL	252414080333200	Cropland	1997	11
					0.006333
					0.0126
				1998	1
					0.00562
					0.00562
				1999	4
					0.010788
					0.0234
				2000	2
					0.007875
					0.0113
				2001	1
					0.00249
					0.00249

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				2002	3
					0.0137
					0.0324
				2003	3
					0.008367
					0.0108
				2004	4
					0.01945
					0.0456
		252523080352500	Cropland	1997	1
					0.00931
					0.00931
ORANGE	FL	02233200	Urban	1994	1
					0.008
					0.008
PALM	FL	02281200	Cropland	1997	3
					0.004757
					0.00586
				1998	1
					0.00292
					0.00292
				1999	1
					0.00694
					0.00694
				2000	1
					0.00331
					0.00331
				2001	2
					0.00436
					0.00552
				2002	2
					0.0115
					0.0155
				2003	1
					0.0261
					0.0261
				2005	4
					0.00735
					0.0107
				2006	3
					0.006133
					0.0077
				2007	1
					0.0048
					0.0048

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
SEMINOLE	FL	02234990	Urban	1994	2
					0.016
					0.026
BAKER	GA	02353000	Mixed	1994	12
					0.008
					0.015
BROOKS	GA	02318500	Mixed	1993	2
					0.0065
					0.008
				1995	4
					0.007375
					0.01
				1998	1
					0.00551
					0.00551
				1999	1
					0.00505
					0.00505
				2000	3
					0.006483
					0.00928
				2001	1
					0.00267
					0.00267
				2002	1
					0.0056
					0.0056
				2003	1
					0.0033
					0.0033
				2005	1
					0.0045
					0.0045
CARROLL	GA	02337500	Reference	1997	1
					0.0737
					0.0737
		02338000	Mixed	1994	2
					0.008
					0.009
				1995	3
					0.012
					0.018
				1997	4
					0.005583
					0.00841

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				1998	2
					0.007815
					0.0121
				1999	1
					0.00712
					0.00712
				2000	2
					0.006165
					0.0073
				2005	2
					0.0057
					0.0065
				2006	1
					0.0061
					0.0061
COBB	GA	02335850	Residential	1994	1
					0.005
					0.005
				1995	1
					0.006
					0.006
		02335860	Residential	1994	1
					0.004
					0.004
		02335864	Residential	1995	1
					0.003
					0.003
		02335865	Residential	1994	1
					0.004
					0.004
		02335868	Residential	1995	1
					0.006
					0.006
		02335869	Residential	1994	1
					0.004
					0.004
		023358694	Residential	1993	2
					0.047
					0.051
				1994	12
					0.013833
					0.025
				1995	4
					0.016
					0.029

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
		02335870	Residential	1993	17
					0.012412
					0.034
				1994	7
					0.008429
					0.012
				1995	1
					0.008
					0.008
				1997	5
					0.007756
					0.0167
				1998	2
					0.00822
					0.0122
				1999	1
					0.0141
					0.0141
				2000	4
					0.005048
					0.00935
				2001	1
					0.0039
					0.0039
				2002	4
					0.00345
					0.0042
				2003	3
					0.0038
					0.0039
				2005	3
					0.006033
					0.0084
		02335910	Urban	1994	2
					0.008
					0.012
				1995	1
					0.005
					0.005
				2003	1
					0.0026
					0.0026
		02336635	Not Applicable	2002	1
					0.0057
					0.0057

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				2003	1
					0.0068
					0.0068
		02336968	Residential	2003	1
					0.0031
					0.0031
COWETA	GA	02344797	Not Applicable	2003	1
					0.0027
					0.0027
DECATUR	GA	02357000	Mixed	1994	1
					0.009
					0.009
DEKALB	GA	02203800	Mixed	1994	2
					0.0145
					0.019
		02336040	Urban	1995	1
					0.007
					0.007
		02336065	Urban	1995	1
					0.006
					0.006
		02336080	Urban	1995	1
					0.006
					0.006
		02336207	Urban	1995	1
					0.004
					0.004
		02336212	Urban	1995	1
					0.003
					0.003
		02336233	Urban	1995	1
					0.013
					0.013
DOOLY	GA	02215080	Agriculture	1993	1
					0.004
					0.004
		02215087	Agriculture	1993	1
					0.018
					0.018
DOUGLAS	GA	02337395	Not Applicable	2003	1
					0.003
					0.003
FAYETTE	GA	02344737	Not Applicable	2003	1
					0.0031
					0.0031

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
FULTON	GA	02335741	Residential	1995	2
					0.006
					0.008
		02335760	Residential	1994	1
					0.005
					0.005
		02335790	Residential	1995	1
					0.004
					0.004
		02336000	Mixed	1995	1
					0.005
					0.005
		02336123	Urban	1995	1
					0.007
					0.007
		02336130	Urban	1994	2
					0.007
					0.008
		02336250	Urban	1994	2
					0.004
					0.004
				1995	1
					0.004
					0.004
		023362775	Urban	1995	1
					0.17
					0.17
		02336295	Urban	1995	1
					0.02
					0.02
		02336300	Urban	1994	2
					0.0125
					0.015
				1995	16
					0.045125
					0.11
				1997	1
					0.0269
					0.0269
		02336313	Urban	1995	1
					0.008
					0.008
		02336380	Residential	1995	1
					0.007
					0.007

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
		02336420	Urban	1995	1
					0.004
					0.004
		02336490	Mixed	1995	1
					0.006
					0.006
		02336529	Urban	1994	1
					0.01
					0.01
		02336728	Urban	1994	1
					0.012
					0.012
				1995	1
					0.002
					0.002
				2003	1
					0.0026
					0.0026
HENRY	GA	02204468	Not Applicable	2003	1
					0.0026
					0.0026
JASPER	GA	02221000	Not Applicable	2003	1
					0.0029
					0.0029
LEE	GA	02350900	Mixed	1994	1
					0.011
					0.011
MILLER	GA	02356980	Cropland	1994	1
					0.099
					0.099
MUSCOGEE	GA	023415605	Urban	1994	2
					0.0075
					0.01
				1995	1
					0.007
					0.007
		02341564	Urban	1995	1
					0.012
					0.012
PIKE	GA	02346358	Not Applicable	2003	1
					0.0041
					0.0041
PULASKI	GA	02215090	Agriculture	1993	1
					0.006
					0.006
		02215100	Agriculture	1993	4

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.006
					0.008
SPALDING	GA	02344480	Not Applicable	2003	1
					0.0033
					0.0033
SUMTER	GA	02350080	Cropland	2001	1
					0.0037
					0.0037
				2003	1
					0.0031
					0.0031
				2005	1
					0.0046
					0.0046
				2007	3
					0.005433
					0.0069
TIFT	GA	02317797	Agriculture	1993	1
					0.021
					0.021
				1999	1
					0.00347
					0.00347
				2000	2
					0.005115
					0.00629
TURNER	GA	02317771	Agriculture	1994	1
					0.009
					0.009
		02317778	Agriculture	1994	1
					0.014
					0.014
UPSON	GA	02347748	Not Applicable	2003	1
					0.0055
					0.0055
HONOLULU	HI	16213000	Mixed	1999	1
					0.0109
					0.0109
				2000	2
					0.01218
					0.02
BLACK	IA	05464020	Mixed	1996	1
					0.009
					0.009
BREMER	IA	05420680	Cropland	1996	1

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.011
					0.011
				1998	1
					0.0222
					0.0222
				2004	1
					0.0051
					0.0051
				2008	3
					0.006533
					0.008
CLINTON	IA	05420500	Not Applicable	1996	3
					0.039333
					0.11
				1997	2
					0.00317
					0.00376
				1998	1
					0.00473
					0.00473
				1999	2
					0.00733
					0.0107
				2000	3
					0.004187
					0.00553
				2002	1
					0.0123
					0.0123
				2008	1
					0.0098
					0.0098
		05422000	Mixed	1996	2
					0.0161
					0.029
DES	IA	05474000	Mixed	1998	1
					0.0594
					0.0594
FLOYD	IA	05461390	Cropland	1998	1
					0.0031
					0.0031
HARDIN	IA	05451210	Cropland	1996	1
					0.013
					0.013
				2005	1

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.0067
					0.0067
				2006	1
					0.0045
					0.0045
				2007	4
					0.010825
					0.02
				2008	3
					0.005833
					0.0085
				2009	4
					0.00805
					0.0115
IOWA	IA	05453100	Mixed	1996	1
					0.015
					0.015
				1998	1
					0.0291
					0.0291
JOHNSON	IA	05454500	Not Applicable	2007	2
					0.00535
					0.0062
		05455100	Cropland	1996	3
					0.017
					0.033
				1998	2
					0.0107
					0.0176
LOUISA	IA	05465500	Mixed	1997	2
					0.02485
					0.0478
				1998	1
					0.0261
					0.0261
				2002	1
					0.007
					0.007
				2004	1
					0.0062
					0.0062
				2005	1
					0.0103
					0.0103
				2009	2

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.00695
					0.0103
TAMA	IA	05464220	Cropland	1996	1
					0.007
					0.007
				1997	2
					0.002925
					0.00378
				1998	1
					0.0666
					0.0666
WASHINGTON	IA	05455570	Cropland	1996	2
					0.0175
					0.028
				1997	2
					0.004905
					0.00581
WRIGHT	IA	05449500	Cropland	1997	1
					0.00217
					0.00217
				2004	1
					0.0037
					0.0037
BEAR	ID	10068500	Rangeland	2001	1
					0.00441
					0.00441
ELMORE	ID	13154500	Mixed	2005	1
					0.0038
					0.0038
				2007	1
					0.0031
					0.0031
TWIN	ID	13092713	Agriculture	1994	1
					0.19
					0.19
		13092715	Agriculture	1994	1
					0.011
					0.011
		13092747	Agriculture	1994	2
					0.008
					0.01
				1997	1
					0.00578
					0.00578
				2000	2

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.00225
					0.00306
				2004	1
					0.0062
					0.0062
				2005	2
					0.00335
					0.0034
				2008	3
					0.004367
					0.0054
ALEXANDER	IL	07022000	Not Applicable	1996	5
					0.021
					0.05
				1997	4
					0.003468
					0.0059
				1999	1
					0.0158
					0.0158
COOK	IL	05531500	Urban	2000	1
					0.00686
					0.00686
				2002	1
					0.0126
					0.0126
				2007	7
					0.006471
					0.0119
		05532500	Mixed	2003	1
					0.0049
					0.0049
IROQUOIS	IL	05525500	Cropland	1999	5
					0.0243
					0.0515
				2000	4
					0.009563
					0.0134
				2001	2
					0.0087
					0.0149
				2002	1
					0.0369
					0.0369
				2003	1

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.0066
					0.0066
JERSEY	IL	05587455	Not Applicable	1997	1
					0.00365
					0.00365
LA	IL	05543500	Mixed	1996	4
					0.0145
					0.031
				1997	1
					0.0155
					0.0155
		05552500	Mixed	1996	5
					0.01608
					0.059
		05553500	Mixed	1997	5
					0.005586
					0.00969
				1998	3
					0.013503
					0.0303
				1999	1
					0.0185
					0.0185
				2000	1
					0.0037
					0.0037
				2001	1
					0.0025
					0.0025
				2003	1
					0.0099
					0.0099
MCDONOUGH	IL	05584500	Cropland	1997	5
					0.06316
					0.117
				1998	1
					0.00382
					0.00382
PIATT	IL	05572000	Cropland	1997	19
					0.035539
					0.131
				1998	1
					0.00223
					0.00223
				2003	1

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.0433
					0.0433
				2004	1
					0.0075
					0.0075
				2008	3
					0.004733
					0.0054
PULASKI	IL	03612500	Not Applicable	1996	10
					0.00758
					0.0233
				1997	6
					0.005767
					0.0138
				1998	3
					0.01111
					0.025
				1999	3
					0.004883
					0.00682
				2000	7
					0.005509
					0.00909
				2001	2
					0.00227
					0.00334
SCOTT	IL	05586100	Mixed	1996	4
					0.01195
					0.017
				1997	2
					0.00398
					0.004
				1999	1
					0.0318
					0.0318
				2001	1
					0.0025
					0.0025
				2002	1
					0.0046
					0.0046
				2003	2
					0.0064
					0.007
				2006	2

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.0047
					0.0048
				2008	1
					0.0057
					0.0057
STARK	IL	05568800	Cropland	1996	1
					0.0037
					0.0037
				1998	1
					0.0269
					0.0269
WOODFORD	IL	05567000	Cropland	1997	1
					0.0039
					0.0039
ALLEN	IN	04183000	Cropland	1996	4
					0.0317
					0.0919
				1997	4
					0.0211
					0.045
BARTHOLOMEW	IN	391732085414401	Cropland	1994	2
					0.0095
					0.014
DAVIESS	IN	385234087071801	Mixed	1995	2
					0.0055
					0.006
GIBSON	IN	03374100	Mixed	1992	7
					0.007714
					0.015
				1993	11
					0.020273
					0.13
				1995	10
					0.0289
					0.069
				1996	6
					0.085167
					0.13
				1997	1
					0.00822
					0.00822
				2000	3
					0.006637
					0.0138
				2003	2

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.00315
					0.0039
				2005	1
					0.0046
					0.0046
HAMILTON	IN	395743086030501	Not Applicable	2003	3
					0.006767
					0.0081
				2005	2
					0.00375
					0.004
HANCOCK	IN	394340085524601	Cropland	1992	5
					0.0102
					0.023
				1993	8
					0.00875
					0.021
				1996	2
					0.044
					0.073
				2003	4
					0.004375
					0.0068
				2004	8
					0.01095
					0.021
				2006	1
					0.005
					0.005
				2008	2
					0.00625
					0.0077
JEFFERSON	IN	03366500	Cropland	1994	1
					0.014
					0.014
MARION	IN	03353637	Urban	1992	43
					0.01314
					0.067
				1993	24
					0.017958
					0.08
				1994	5
					0.0136
					0.025
				1995	6

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.0115
					0.026
				1996	6
					0.029833
					0.11
				1997	5
					0.005486
					0.0102
				1998	2
					0.00529
					0.00672
				2000	2
					0.00918
					0.0117
				2001	3
					0.0309
					0.0704
				2002	1
					0.0065
					0.0065
MORGAN	IN	03354000	Mixed	1994	9
					0.018
					0.026
				1995	2
					0.012
					0.012
ORANGE	IN	03373530	Cropland	1995	1
					0.006
					0.006
PERRY	IN	03303280	Not Applicable	1996	6
					0.0055
					0.0085
				1997	3
					0.007827
					0.0112
				1998	4
					0.005758
					0.0122
				2000	2
					0.010825
					0.018
POSEY	IN	03378500	Not Applicable	1997	2
					0.023865
					0.0405
				1998	3

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.023047
					0.0608
				1999	5
					0.009238
					0.0154
				2000	6
					0.0062
					0.0128
				2001	1
					0.004
					0.004
				2002	2
					0.0034
					0.0036
				2003	1
					0.0053
					0.0053
				2004	2
					0.005
					0.0053
				2008	1
					0.0064
					0.0064
PUTNAM	IN	03357330	Not Applicable	2002	2
					0.0244
					0.0451
		393306086585201	Cropland	1994	2
					0.01
					0.011
				1995	1
					0.008
					0.008
GREENUP	KY	03216600	Not Applicable	1997	3
					0.00495
					0.00602
				1998	4
					0.003295
					0.0049
				1999	1
					0.00342
					0.00342
				2000	2
					0.002415
					0.00275
MCCRACKEN	KY	03609750	Not Applicable	1997	2

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.003565
					0.0046
				1998	2
					0.00504
					0.00702
				1999	2
					0.00395
					0.00516
				2000	7
					0.005299
					0.00948
				2008	1
					0.0053
					0.0053
ACADIA	LA	08011020	Cropland	2000	1
					0.00273
					0.00273
		301959092323400	Cropland	2000	1
					0.0106
					0.0106
		302403092152300	Cropland	2000	1
					0.00186
					0.00186
		302749092203500	Cropland	2000	1
					0.00289
					0.00289
ASSUMPTION	LA	073814675	Mixed	2000	1
					0.00279
					0.00279
EAST	LA	07379960	Urban	1998	3
					0.008673
					0.0103
				1999	14
					0.010796
					0.028
				2000	23
					0.008965
					0.0218
				2001	1
					0.0033
					0.0033
				2002	2
					0.00675
					0.0088
				2003	2

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.00655
					0.0088
IBERVILLE	LA	07381440	Cropland	1998	1
					0.00362
					0.00362
				2000	3
					0.016927
					0.036
JEFFERSON	LA	08012150	Mixed	1999	1
					0.013
					0.013
				2000	1
					0.0157
					0.0157
				2004	1
					0.0064
					0.0064
				2005	1
					0.0069
					0.0069
				2006	1
					0.0108
					0.0108
				2007	7
					0.005386
					0.0079
LAFOURCHE	LA	07381002	Cropland	1999	2
					0.00239
					0.00328
MADISON	LA	07369500	Cropland	1996	6
					0.016667
					0.023
				1997	6
					0.023
					0.052
POINTE	LA	07381495	Not Applicable	1996	2
					0.008
					0.008
				1997	3
					0.007267
					0.0104
				1998	1
					0.0077
					0.0077
				2004	1

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.0041
					0.0041
ST.	LA	08010000	Cropland	1999	2
					0.00942
					0.0131
				2000	5
					0.010332
					0.0163
				2001	1
					0.0081
					0.0081
ST.	LA	07381600	Not Applicable	2008	1
					0.0059
					0.0059
WEST	LA	07373420	Not Applicable	1997	2
					0.011165
					0.0176
MIDDLESEX	MA	01102500	Urban	1999	3
					0.007637
					0.00958
NORFOLK	MA	01105000	Urban	2000	1
					0.00324
					0.00324
PLYMOUTH	MA	01106468	Urban	2000	2
					0.00373
					0.00458
FREDERICK	MD	01639000	Agriculture	1994	1
					0.03
					0.03
				1995	4
					0.0125
					0.031
				1996	3
					0.005333
					0.007
		01643020	Mixed	1996	3
					0.005333
					0.006
HARFORD	MD	01578310	Mixed	1996	1
					0.004
					0.004
				1997	1
					0.00225
					0.00225
				2000	1

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.00157
					0.00157
				2001	1
					0.0012
					0.0012
				2009	1
					0.0059
					0.0059
				2010	1
					0.0948
					0.0948
KENT	MD	01493112	Agriculture	1999	9
					0.004258
					0.00698
				2000	3
					0.006587
					0.0135
				2002	1
					0.0027
					0.0027
MONTGOMERY	MD	01646350	Urban	1994	1
					0.009
					0.009
		01650900	Urban	1994	1
					0.019
					0.019
WASHINGTON	MD	01614500	Mixed	1996	2
					0.0125
					0.014
		01619200	Urban	1993	1
					0.01
					0.01
MACOMB	MI	04161820	Urban	1996	3
					0.006533
					0.0106
				1997	4
					0.006398
					0.0113
				2001	1
					0.0028
					0.0028
ST	MI	04159492	Cropland	1996	2
					0.01145
					0.0178
ANOKA	MN	05288475	Urban	1997	1

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.00416
					0.00416
		05288650	Not Applicable	2005	2
					0.00625
					0.0071
BLUE	MN	05320270	Agriculture	2003	1
					0.0066
					0.0066
				2005	2
					0.0125
					0.0217
				2006	6
					0.009433
					0.021
				2007	6
					0.006983
					0.0159
DAKOTA	MN	05331580	Mixed	1998	1
					0.00377
					0.00377
				2000	1
					0.00163
					0.00163
				2001	1
					0.0062
					0.0062
				2009	1
					0.0078
					0.0078
HENNEPIN	MN	05288705	Urban	1997	2
					0.0083
					0.00844
MARSHALL	MN	05085900	Cropland	1993	2
					0.0185
					0.031
				1994	1
					0.02
					0.02
MONTGOMERY	MO	06934500	Not Applicable	1996	3
					0.038667
					0.046
				2002	1
					0.0052
					0.0052
POLK	MO	06921070	Pasture	1995	1

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.009
					0.009
STODDARD	MO	07043500	Cropland	1996	1
					0.01
					0.01
				1997	2
					0.004185
					0.00447
WRIGHT	MO	06927590	Pasture	1995	1
					0.007
					0.007
WARREN	MS	07288955	Mixed	1996	4
					0.01725
					0.035
				1997	2
					0.0085
					0.009
				2005	1
					0.0037
					0.0037
				2006	2
					0.0054
					0.0062
				2007	1
					0.0062
					0.0062
				2009	2
					0.00745
					0.0079
WASHINGTON	MS	07288650	Cropland	1996	2
					0.039
					0.072
				2004	1
					0.0069
					0.0069
				2006	1
					0.0044
					0.0044
				2007	2
					0.00515
					0.0055
RICHLAND	MT	06329500	Mixed	1998	2
					0.00278
					0.00288
				2000	3

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.001853
					0.00202
ROSEBUD	MT	06295000	Mixed	1999	1
					0.00177
					0.00177
				2009	1
					0.0048
					0.0048
ALAMANCE	NC	0209679804	Not Applicable	2003	1
					0.0085
					0.0085
BUNCOMBE	NC	0344776625	Mixed	1997	1
					0.00416
					0.00416
		0344878100	Urban	1997	1
					0.00597
					0.00597
		03451500	Mixed	1997	1
					0.00474
					0.00474
BURKE	NC	02143040	Forest	1996	1
					0.007
					0.007
EDGECOMBE	NC	02083500	Mixed	1993	1
					0.007
					0.007
FRANKLIN	NC	02082731	Agriculture	1993	1
					0.01
					0.01
GASTON	NC	02145112	Mixed	1996	1
					0.006
					0.006
GATES	NC	02053580	Agriculture	1994	1
					0.058
					0.058
GREENE	NC	02091000	Agriculture	1995	1
					0.006
					0.006
		02091500	Mixed	1995	1
					0.005
					0.005
				1997	2
					0.004375
					0.00545
				1998	6

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.005872
					0.00805
				1999	1
					0.0049
					0.0049
				2000	2
					0.002655
					0.00314
				2001	1
					0.0027
					0.0027
				2003	3
					0.011567
					0.0214
				2004	1
					0.006
					0.006
				2005	1
					0.0038
					0.0038
				2008	4
					0.007325
					0.0086
		0209171600	Agriculture	1995	1
					0.007
					0.007
		0209173200	Agriculture	1995	1
					0.007
					0.007
HENDERSON	NC	0344602100	Forest	1997	1
					0.00587
					0.00587
		0344700000	Urban	1997	1
					0.00478
					0.00478
		0344766600	Agriculture	1997	1
					0.0059
					0.0059
JOHNSTON	NC	0208755215	Not Applicable	2005	1
					0.0037
					0.0037
LENOIR	NC	0208925200	Agriculture	1995	1
					0.013
					0.013
		02089500	Mixed	1997	2

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.003635
					0.00427
				1998	2
					0.0033
					0.00358
				2003	1
					0.0036
					0.0036
MADISON	NC	0345292005	Agriculture	1997	1
					0.00382
					0.00382
		03453500	Mixed	1997	1
					0.00546
					0.00546
MARTIN	NC	0208104942	Agriculture	1994	1
					0.008
					0.008
PITT	NC	02083833	Agriculture	1993	3
					0.009333
					0.01
		02084160	Agriculture	1992	12
					0.00475
					0.008
				1995	1
					0.01
					0.01
		0209160450	Mixed	1995	1
					0.009
					0.009
		02091700	Mixed	1995	1
					0.01
					0.01
TRANSYLVANIA	NC	03439000	Reference	1997	1
					0.00347
					0.00347
WAKE	NC	0208726370	Not Applicable	2003	1
					0.0025
					0.0025
		0208726995	Not Applicable	2003	1
					0.0022
					0.0022
		0208732610	Not Applicable	2003	1
					0.004
					0.004
		02087580	Urban	2002	1

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.0069
					0.0069
				2003	2
					0.00655
					0.0079
				2007	1
					0.0051
					0.0051
WILSON	NC	0209051600	Agriculture	1994	1
					0.034
					0.034
				1995	1
					0.042
					0.042
		02090519	Mixed	1994	2
					0.0075
					0.01
				1995	1
					0.014
					0.014
CASS	ND	05053800	Mixed	1995	1
					0.004
					0.004
GRAND	ND	05082625	Cropland	2000	1
					0.00257
					0.00257
		05083100	Cropland	1994	1
					0.018
					0.018
PEMBINA	ND	05102490	Mixed	1994	2
					0.0045
					0.006
				1996	2
					0.01935
					0.034
				1998	1
					0.0074
					0.0074
				1999	2
					0.005105
					0.00676
COLFAX	NE	06799750	Not Applicable	2004	2
					0.0071
					0.0099
DODGE	NE	06800000	Agriculture	1992	16

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.029313
					0.13
				1993	4
					0.03825
					0.122
				1997	2
					0.023995
					0.0416
				1998	3
					0.035537
					0.0843
				1999	3
					0.008097
					0.0113
				2000	1
					0.00404
					0.00404
				2002	6
					0.005633
					0.0091
				2003	10
					0.00735
					0.0237
				2004	12
					0.010775
					0.029
				2005	1
					0.0031
					0.0031
				2008	10
					0.01376
					0.0431
DOUGLAS	NE	06610000	Not Applicable	1996	1
					0.016
					0.016
				2001	1
					0.0066
					0.0066
				2002	2
					0.00455
					0.0054
				2003	1
					0.0077
					0.0077
				2004	2

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.0082
					0.012
		06800500	Mixed	1993	2
					0.0915
					0.109
				2002	1
					0.0119
					0.0119
				2003	2
					0.02745
					0.0363
				2004	1
					0.0061
					0.0061
				2007	5
					0.00472
					0.0054
HALL	NE	06773050	Cropland	1993	4
					0.0595
					0.107
PLATTE	NE	06795500	Agriculture	1993	8
					0.029375
					0.071
				2009	11
					0.008955
					0.0287
SARPY	NE	06805500	Mixed	1992	13
					0.031154
					0.11
				1993	3
					0.039667
					0.072
				1997	3
					0.005143
					0.00903
				1998	1
					0.0473
					0.0473
				1999	2
					0.0342
					0.0586
				2000	1
					0.0149
					0.0149
				2002	1

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.001
					0.001
				2003	2
					0.00485
					0.0069
				2004	1
					0.0045
					0.0045
				2007	1
					0.004
					0.004
				2008	3
					0.0104
					0.0224
				2009	1
					0.0076
					0.0076
HILLSBOROUGH	NH	01094161	Urban	2000	1
					0.00143
					0.00143
BERGEN	NJ	01390450	Other/Mixed	1997	1
					0.0023
					0.0023
		01390500	Residential	1996	7
					0.015571
					0.064
		01390815	Residential	1997	1
					0.0048
					0.0048
		01391500	Commercial/Industrial	1997	1
					0.0047
					0.0047
BURLINGTON	NJ	01467000	Reference	2000	1
					0.00483
					0.00483
CAMDEN	NJ	01410784	Urban	1996	1
					0.013
					0.013
		01467150	Residential	1999	7
					0.006413
					0.0164
				2000	5
					0.00572
					0.00838
				2001	2

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.0034
					0.0039
CUMBERLAND	NJ	01411790	Residential	1997	1
					0.0043
					0.0043
ESSEX	NJ	01382000	Mixed	1996	3
					0.0082
					0.009
				1997	1
					0.0046
					0.0046
				1999	1
					0.00695
					0.00695
GLOUCESTER	NJ	01475000	Urban	1997	1
					0.0052
					0.0052
		01477120	Cropland	1999	3
					0.007487
					0.00898
				2001	1
					0.004
					0.004
MERCER	NJ	01401000	Residential	1996	2
					0.0045
					0.005
		01463500	Mixed	2000	1
					0.00231
					0.00231
				2001	1
					0.0023
					0.0023
				2006	1
					0.0053
					0.0053
		01463810	Urban	2000	2
					0.00255
					0.00288
		01464500	Agriculture	1999	1
					0.00242
					0.00242
MORRIS	NJ	01381295	Commercial/Industrial	1997	1
					0.001
					0.001
		01381800	Commercial/Indust	1997	1

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
			rial		
					0.0036
					0.0036
OCEAN	NJ	01408500	Forest	1997	1
					0.0067
					0.0067
		01408600	Residential	1998	1
					0.0124
					0.0124
		01408728	Urban	1998	1
					0.0102
					0.0102
SOMERSET	NJ	01403300	Mixed	1996	3
					0.0161
					0.035
				1997	1
					0.0089
					0.0089
				1998	1
					0.00365
					0.00365
				1999	1
					0.00584
					0.00584
				2001	1
					0.0041
					0.0041
		01403900	Urban	1996	16
					0.017906
					0.044
				1997	8
					0.011738
					0.0216
				1998	2
					0.0063
					0.00776
				2001	2
					0.0057
					0.008
				2004	1
					0.0114
					0.0114
				2007	1
					0.0079
					0.0079

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
SUSSEX	NJ	01367770	Forest	1997	1
					0.0016
					0.0016
UNION	NJ	01393400	Residential	1997	1
					0.0071
					0.0071
		01394500	Forest	1997	1
					0.0063
					0.0063
VALENCIA	NM	08331000	Mixed	1994	1
					0.006
					0.006
				1995	2
					0.006
					0.006
				1996	2
					0.00775
					0.008
CLARK	NV	094196783	Urban	1993	3
					0.011333
					0.015
				1994	4
					0.0235
					0.047
				1995	11
					0.073091
					0.16
				1997	4
					0.01445
					0.0208
				1998	11
					0.007744
					0.0166
				1999	1
					0.0023
					0.0023
				2000	6
					0.108172
					0.57
				2001	4
					0.002903
					0.00382
				2007	1
					0.0055
					0.0055

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
		09419790	Mixed	1994	4
					0.0145
					0.025
STOREY	NV	10350500	Mixed	1998	1
					0.00682
					0.00682
				2000	1
					0.00295
					0.00295
				2002	1
					0.005
					0.005
				2005	1
					0.0062
					0.0062
WASHOE	NV	10349995	Mixed	1994	3
					0.016
					0.021
MONTGOMERY	NY	01349150	Agriculture	2000	1
					0.0235
					0.0235
SCHENECTADY	NY	01356190	Residential	1994	1
					0.009
					0.009
				2005	1
					0.0054
					0.0054
ULSTER	NY	01371500	Mixed	1994	1
					0.01
					0.01
				1996	2
					0.0205
					0.024
ASHTABULA	OH	04211820	Pasture	1996	1
					0.0046
					0.0046
				1997	4
					0.034465
					0.106
BUTLER	OH	03274000	Mixed	1999	2
					0.0316
					0.0403
				2000	1
					0.00324
					0.00324

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				2001	1
					0.002
					0.002
CLARK	OH	03267900	Cropland	2000	1
					0.00593
					0.00593
				2004	1
					0.0074
					0.0074
CLERMONT	OH	03246400	Cropland	2000	2
					0.00388
					0.00426
CUYAHOGA	OH	04208504	Mixed	1996	6
					0.016167
					0.025
				1997	7
					0.010883
					0.0225
DARKE	OH	400834084445500	Agriculture	2000	1
					0.0469
					0.0469
		401208084325700	Agriculture	2000	1
					0.00832
					0.00832
		401404084381200	Agriculture	2000	1
					0.00958
					0.00958
		401612084280200	Agriculture	2000	1
					0.029
					0.029
DEFIANCE	OH	04178000	Cropland	1996	3
					0.077333
					0.211
				1997	5
					0.010536
					0.0195
				1998	1
					0.00702
					0.00702
				2003	1
					0.0055
					0.0055
				2004	1
					0.034
					0.034

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
GREENE	OH	393903083582900	Urban	2001	1
					0.0049
					0.0049
		394727083523000	Urban	2001	1
					0.0051
					0.0051
LUCAS	OH	04193500	Mixed	1996	9
					0.014344
					0.0299
				1997	5
					0.00921
					0.0248
				2000	2
					0.00697
					0.0102
				2001	2
					0.00335
					0.0037
				2002	1
					0.003
					0.003
				2003	1
					0.0108
					0.0108
				2004	1
					0.019
					0.019
				2005	1
					0.005
					0.005
				2006	6
					0.004917
					0.006
				2007	6
					0.00631
					0.0113
MIAMI	OH	395611084180600	Mixed	2000	2
					0.02351
					0.0422
		395929084210500	Agriculture	2000	1
					0.0198
					0.0198
		400039084250900	Agriculture	2000	1
					0.011
					0.011

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
		400906084255300	Agriculture	2000	1
					0.0069
					0.0069
		400937084240400	Agriculture	2000	1
					0.0251
					0.0251
MONTGOMERY	OH	393944084120700	Urban	1999	7
					0.014169
					0.0571
				2000	9
					0.008207
					0.0121
				2001	3
					0.004233
					0.0047
				2002	1
					0.0062
					0.0062
				2003	1
					0.0109
					0.0109
		394111084234200	Urban	2001	1
					0.005
					0.005
		395355084173600	Agriculture	2000	1
					0.00566
					0.00566
PUTNAM	OH	04186500	Cropland	1996	2
					0.02815
					0.051
				1997	6
					0.012413
					0.024
				1998	1
					0.0192
					0.0192
				2001	1
					0.0119
					0.0119
				2003	1
					0.0124
					0.0124
				2004	1
					0.0077
					0.0077

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				2005	2
					0.00615
					0.008
				2008	1
					0.0037
					0.0037
WARREN	OH	392219084172100	Urban	2001	1
					0.0063
					0.0063
BENTON	OR	442223123153703	Agriculture	1994	1
					0.009
					0.009
CLACKAMAS	OR	14202000	Agriculture	1993	3
					0.007333
					0.008
				1994	4
					0.01125
					0.032
				1995	3
					0.012333
					0.017
				1996	2
					0.0099
					0.0115
		14207500	Mixed	1994	1
					0.007
					0.007
		14211550	Urban	1993	1
					0.01
					0.01
		452337122243500	Not Applicable	2004	4
					0.01265
					0.022
		452414122213200	Not Applicable	2004	4
					0.002975
					0.0046
COLUMBIA	OR	14246900	Not Applicable	1996	2
					0.00355
					0.0048
				1997	2
					0.0045
					0.005
				1998	3
					0.00356
					0.004

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				2000	1
					0.00348
					0.00348
				2003	1
					0.0128
					0.0128
				2004	1
					0.0056
					0.0056
				2007	2
					0.0054
					0.0056
				2008	2
					0.0058
					0.0067
				2009	1
					0.005
					0.005
				2010	2
					0.00405
					0.0061
MARION	OR	14201300	Agriculture	1993	9
					0.020111
					0.038
				1994	8
					0.014625
					0.033
				1995	3
					0.147333
					0.401
				1996	2
					0.00455
					0.0054
				1997	7
					0.012646
					0.0285
				1998	5
					0.014734
					0.0312
				1999	5
					0.04326
					0.109
				2000	9
					0.017223
					0.0804

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				2001	15
					0.010193
					0.0461
				2002	24
					0.011142
					0.0344
				2003	11
					0.009555
					0.056
				2004	8
					0.018463
					0.0496
				2005	6
					0.050483
					0.209
				2006	4
					0.0539
					0.172
				2007	5
					0.0124
					0.0145
				2008	16
					0.017906
					0.121
		445551123015800	Not Applicable	2004	2
					0.00355
					0.0037
		450022123012400	Not Applicable	2003	1
					0.0019
					0.0019
				2004	2
					0.0037
					0.0044
		450343122443203	Agriculture	1994	1
					0.005
					0.005
		450417122461603	Agriculture	1994	1
					0.004
					0.004
		450431122454602	Agriculture	1994	1
					0.025
					0.025
		450517122471503	Agriculture	1994	1
					0.008
					0.008

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
MULTNOMAH	OR	14128910	Not Applicable	1997	2
					0.005
					0.005
				1998	1
					0.0036
					0.0036
				2000	1
					0.00602
					0.00602
		14211720	Mixed	1994	1
					0.0059
					0.0059
				1995	1
					0.0049
					0.0049
				1996	5
					0.00756
					0.0131
				1997	12
					0.005445
					0.0135
				1998	7
					0.003786
					0.00705
				1999	4
					0.002645
					0.00365
				2000	6
					0.005388
					0.0075
				2002	1
					0.0067
					0.0067
				2003	2
					0.0065
					0.0109
				2005	3
					0.006833
					0.0098
				2006	4
					0.0063
					0.009
				2007	9
					0.006656
					0.0137

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				2008	4
					0.006425
					0.0099
				2009	1
					0.0063
					0.0063
WASHINGTON	OR	14206950	Urban	1993	8
					0.027375
					0.046
				1994	9
					0.012022
					0.022
				1995	4
					0.0174
					0.0398
				2001	7
					0.003733
					0.0063
				2002	6
					0.0068
					0.0124
				2003	1
					0.0054
					0.0054
				2005	2
					0.00525
					0.0053
				2006	2
					0.00805
					0.0091
				2007	1
					0.0046
					0.0046
				2009	1
					0.0066
					0.0066
ALLEGHENY	PA	03049646	Urban	1996	1
					0.004
					0.004
				1997	1
					0.00264
					0.00264
BERKS	PA	01470744	Agriculture	2000	1
					0.00895
					0.00895

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
		01470779	Cropland	2000	3
					0.00556
					0.00729
		01470818	Agriculture	2000	1
					0.00344
					0.00344
		01471520	Urban	2000	1
					0.00248
					0.00248
BLAIR	PA	402836078103601	Agriculture	1994	1
					0.008
					0.008
BUCKS	PA	01462949	Urban	2000	1
					0.0014
					0.0014
		01464907	Residential	1999	2
					0.029405
					0.0508
				2000	1
					0.00487
					0.00487
				2001	1
					0.0037
					0.0037
CHESTER	PA	01472157	Cropland	2000	2
					0.002425
					0.00258
				2004	1
					0.0173
					0.0173
		01478200	Urban	2000	1
					0.0213
					0.0213
		01480350	Urban	2000	1
					0.0242
					0.0242
		01480775	Urban	2000	1
					0.00781
					0.00781
		01480890	Urban	2000	1
					0.00192
					0.00192
CUMBERLAND	PA	01571490	Urban	1993	3
					0.019333
					0.024

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				1994	2
					0.0145
					0.019
				1995	12
					0.013167
					0.047
		401303076562001	Mixed	1994	1
					0.009
					0.009
		401334076551001	Mixed	1994	1
					0.009
					0.009
DAUPHIN	PA	01571000	Urban	1994	1
					0.004
					0.004
DELAWARE	PA	01475510	Urban	2000	1
					0.00161
					0.00161
		01475543	Urban	2000	2
					0.0026
					0.00334
INDIANA	PA	03037525	Agriculture	1996	1
					0.009
					0.009
				1997	3
					0.005463
					0.00959
LANCASTER	PA	01576540	Agriculture	1993	4
					0.00825
					0.01
				1994	4
					0.014
					0.024
LEBANON	PA	01573095	Agriculture	1995	15
					0.0132
					0.09
		401632076290701	Mixed	1995	1
					0.024
					0.024
		401704076293101	Mixed	1995	1
					0.004
					0.004
		401809076301901	Mixed	1995	1
					0.007
					0.007

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
LEHIGH	PA	01451425	Agriculture	2000	1
					0.00599
					0.00599
		01451624	Urban	2000	1
					0.00634
					0.00634
MONTGOMERY	PA	01467040	Urban	2000	1
					0.0153
					0.0153
		01473470	Urban	2000	1
					0.00208
					0.00208
NORTHAMPTON	PA	01454700	Mixed	2000	2
					0.003625
					0.00505
NORTHUMBERLAND	PA	01555500	Mixed	1995	1
					0.041
					0.041
PERRY	PA	01567000	Mixed	1995	1
					0.017
					0.017
PHILADELPHIA	PA	01474000	Urban	1999	1
					0.0047
					0.0047
		01474500	Mixed	2000	6
					0.003617
					0.0049
				2001	1
					0.0013
					0.0013
				2002	1
					0.0049
					0.0049
PIKE	PA	01434000	Mixed	2000	1
					0.00272
					0.00272
SCHUYLKILL	PA	01555400	Agriculture	1993	9
					0.014444
					0.038
				1994	1
					0.013
					0.013
				1995	1
					0.015
					0.015

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				1998	1
					0.0116
					0.0116
				2000	7
					0.004844
					0.0104
SNYDER	PA	01555000	Mixed	1995	1
					0.023
					0.023
GREENVILLE	SC	021603257	Urban	1996	3
					0.007533
					0.0156
ORANGEBURG	SC	02174250	Cropland	1996	31
					0.012929
					0.057
				1998	1
					0.0152
					0.0152
				1999	10
					0.024763
					0.0843
				2000	10
					0.006876
					0.0177
				2001	7
					0.00754
					0.0177
				2002	2
					0.0178
					0.0179
				2003	2
					0.00825
					0.01
				2004	2
					0.0095
					0.0115
				2005	6
					0.0621
					0.338
				2006	10
					0.00566
					0.0082
				2007	1
					0.005
					0.005

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				2008	9
					0.008078
					0.0122
RICHLAND	SC	021695601	Urban	1996	1
					0.0018
					0.0018
		021695610	Urban	1996	1
					0.0091
					0.0091
		021695614	Urban	1996	1
					0.0076
					0.0076
		021695617	Urban	1996	1
					0.0032
					0.0032
		021695626	Urban	1996	1
					0.0063
					0.0063
		021695639	Urban	1996	1
					0.0051
					0.0051
		021695658	Urban	1996	1
					0.0098
					0.0098
		021695666	Urban	1996	1
					0.0142
					0.0142
		021695684	Urban	1996	1
					0.0318
					0.0318
		02169570	Urban	1996	29
					0.014276
					0.095
				1997	2
					0.00605
					0.0063
				2001	2
					0.00302
					0.00414
				2003	1
					0.0048
					0.0048
				2005	1
					0.0078
					0.0078

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
HUGHES	SD	06440000	Not Applicable	1998	1
					0.00344
					0.00344
YANKTON	SD	06467500	Not Applicable	2003	1
					0.0036
					0.0036
CLAIBORNE	TN	03528000	Mixed	1997	1
					0.0034
					0.0034
COCKE	TN	03455000	Mixed	1996	2
					0.00315
					0.0043
				1997	3
					0.007033
					0.0111
		03461080	Forest	1996	1
					0.005
					0.005
		03467609	Mixed	1996	3
					0.006433
					0.014
GILES	TN	03584600	Mixed	2000	1
					0.00845
					0.00845
GREENE	TN	03466208	Agriculture	1996	12
					0.007983
					0.033
				1997	1
					0.0041
					0.0041
				2000	1
					0.00989
					0.00989
		03466835	Agriculture	1997	1
					0.00779
					0.00779
HAWKINS	TN	03490500	Mixed	1997	2
					0.00445
					0.0049
ROANE	TN	03541498	Forest	1996	1
					0.012
					0.012
SHELBY	TN	07031692	Urban	1996	4
					0.032625
					0.0673

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				1997	22
					0.060141
					0.251
				2002	3
					0.011133
					0.0171
				2003	2
					0.0101
					0.0118
				2004	2
					0.01255
					0.0151
WASHINGTON	TN	03465500	Mixed	1996	2
					0.0052
					0.006
				1997	1
					0.0119
					0.0119
BEXAR	TX	08178800	Urban	1997	10
					0.006404
					0.0103
				1998	2
					0.003475
					0.00424
				2005	2
					0.00605
					0.0066
		08181800	Mixed	1997	9
					0.005604
					0.0094
				1998	2
					0.00488
					0.00516
				2001	1
					0.00432
					0.00432
CAMERON	TX	08470400	Not Applicable	1996	9
					0.069078
					0.22
				1997	9
					0.025999
					0.11
				2001	1
					0.0233
					0.0233

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				2002	1
					0.0145
					0.0145
				2003	2
					0.0084
					0.0133
				2005	2
					0.0176
					0.022
				2006	2
					0.01755
					0.0182
				2007	3
					0.007633
					0.0122
		08475000	Not Applicable	1996	2
					0.0145
					0.026
				1997	1
					0.00928
					0.00928
				1998	1
					0.00881
					0.00881
				2002	1
					0.007
					0.007
				2003	3
					0.005333
					0.0061
				2004	4
					0.006625
					0.0079
				2005	1
					0.0076
					0.0076
				2006	6
					0.01175
					0.0174
				2007	6
					0.00805
					0.0164
				2008	5
					0.00626
					0.0082

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				2009	4
					0.013325
					0.0353
COLLIN	TX	08058900	Agriculture	1994	1
					0.01
					0.01
COOKE	TX	08050800	Reference	1993	1
					0.007
					0.007
DALLAS	TX	08050100	Urban	1994	1
					0.015
					0.015
		08055500	Not Applicable	2003	1
					0.0033
					0.0033
		08057200	Urban	1995	7
					0.013714
					0.024
				1997	8
					0.010628
					0.0204
				1998	12
					0.008939
					0.0278
				1999	8
					0.007303
					0.0171
				2000	12
					0.012018
					0.0549
				2001	4
					0.003038
					0.0044
				2002	7
					0.007014
					0.0198
				2003	3
					0.004867
					0.0053
				2004	2
					0.0074
					0.0081
				2005	1
					0.008
					0.008

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				2007	3
					0.0087
					0.0114
		08057410	Mixed	1994	1
					0.022
					0.022
				1995	3
					0.011333
					0.015
				1997	3
					0.009623
					0.0114
				1998	2
					0.004575
					0.00595
				1999	4
					0.006248
					0.0114
				2005	1
					0.0042
					0.0042
				2008	2
					0.0065
					0.0066
		08057448	Mixed	1999	1
					0.00479
					0.00479
				2000	3
					0.004493
					0.00744
DENTON	TX	08051500	Reference	1994	1
					0.014
					0.014
				1997	1
					0.00317
					0.00317
				2002	1
					0.0029
					0.0029
EL	TX	08364000	Mixed	1994	1
					0.008
					0.008
				1995	3
					0.005333
					0.008

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
				1996	5
					0.00904
					0.029
				1997	5
					0.007072
					0.02
				1999	2
					0.00774
					0.014
				2000	4
					0.013945
					0.0469
				2001	4
					0.02423
					0.0866
				2002	1
					0.005
					0.005
				2003	4
					0.005875
					0.0087
				2004	2
					0.0087
					0.0092
				2005	6
					0.008817
					0.0164
				2006	11
					0.006882
					0.0156
				2007	4
					0.007675
					0.0102
FORT	TX	08116650	Not Applicable	2008	1
					0.0075
					0.0075
FREESTONE	TX	08064700	Agriculture	1994	1
					0.009
					0.009
HOUSTON	TX	08065350	Mixed	1994	2
					0.0065
					0.009
KAUFMAN	TX	08062000	Urban	1994	1
					0.017
					0.017
		08062900	Agriculture	1994	2

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.0325
					0.048
KENDALL	TX	08167000	Mixed	1997	1
					0.00187
					0.00187
LIBERTY	TX	08067190	Agriculture	1994	1
					0.006
					0.006
MEDINA	TX	08180640	Agriculture	1997	7
					0.005209
					0.00746
NAVARRO	TX	08064100	Agriculture	1995	1
					0.008
					0.008
				2004	1
					0.0086
					0.0086
				2006	1
					0.0062
					0.0062
PRESIDIO	TX	08374200	Not Applicable	1999	1
					0.00347
					0.00347
				2003	1
					0.0029
					0.0029
				2007	1
					0.0089
					0.0089
STARR	TX	08461300	Not Applicable	1996	3
					0.013567
					0.029
				1997	1
					0.0612
					0.0612
TARRANT	TX	08047000	Reference	1994	1
					0.015
					0.015
WALKER	TX	08065800	Agriculture	1994	1
					0.004
					0.004
WEBB	TX	08459200	Not Applicable	1999	1
					0.0172
					0.0172
				2001	1
					0.0027

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.0027
				2002	2
					0.00655
					0.0068
				2003	3
					0.005333
					0.0068
				2004	3
					0.007467
					0.0119
CACHE	UT	10102200	Agriculture	2000	1
					0.00273
					0.00273
DAVIS	UT	410041111581101	Residential	2000	1
					0.00189
					0.00189
		410342111574201	Residential	2000	2
					0.008795
					0.0156
		410453111570001	Residential	2000	1
					0.00183
					0.00183
		410501111555201	Residential	2000	1
					0.00387
					0.00387
GRAND	UT	09180500	Not Applicable	1997	2
					0.003325
					0.004
SALT	UT	10167800	Residential	2000	4
					0.006123
					0.00998
		10168000	Residential	2000	3
					0.005253
					0.00655
		10171000	Mixed	2000	1
					0.0055
					0.0055
		403927111523601	Residential	2000	1
					0.00271
					0.00271
		403945111501001	Urban	2000	1
					0.00357
					0.00357
		404000111515801	Urban	2000	1
					0.00223

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
		404143111500101	Residential	2000	0.00223 1 0.00248
		404349111512201	Residential	2000	0.00248 1 0.00182
		404430111495301	Residential	2000	0.00182 1 0.0017
UTAH	UT	400959111363201	Residential	2000	0.0017 1 0.0226
		401442111402201	Residential	2000	0.0226 1 0.00382
ARLINGTON	VA	01646580	Mixed	1996	0.00382 4 0.0055
		01652370	Urban	1994	0.007 1 0.006
FAIRFAX	VA	01654000	Urban	1994	0.006 17 0.013176
				1995	0.041 6 0.0105
				1997	0.019 9 0.004923
				1998	0.008 5 0.009818
				1999	0.0211 6 0.00643
				2000	0.0102 5 0.004774
				2003	0.00787 1 0.0042
				2005	0.0042 1 0.0064

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
		01656920	Urban	1994	0.0064 1 0.037
HARRISONBURG	VA	01621400	Urban	1993	0.037 1 0.005
PRINCE	VA	01656725	Mixed	1994	0.005 1 0.019
ROCKINGHAM	VA	01621050	Agriculture	1997	0.019 3 0.002537
				1998	0.00367 1 0.00246
				1999	0.00246 1 0.00799
				2000	0.00799 3 0.00883
				2001	0.0122 1 0.0066
				2002	0.0066 5 0.00552
				2003	0.0089 2 0.021
				2009	0.0367 1 0.0038
SCOTT	VA	03526000	Agriculture	1996	0.0038 2 0.0055
SMYTH	VA	03474000	Forest	1996	0.006 1 0.006
SOUTHAMPTON	VA	02047360	Agriculture	1994	0.006 1 0.013
SURRY	VA	02047480	Agriculture	1994	0.013 1 0.008

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.008
WISE	VA	03524550	Mining	1996	1
					0.0097
					0.0097
				1997	1
					0.0017
					0.0017
				1998	1
					0.00421
					0.00421
		03529075	Mining	1996	1
					0.007
					0.007
WYTHE	VA	03167000	Agriculture	1997	1
					0.00265
					0.00265
BENTON	WA	12509696	Agriculture	2000	1
					0.00252
					0.00252
		12510500	Mixed	1999	2
					0.00561
					0.00704
				2001	2
					0.00549
					0.00612
				2002	2
					0.0041
					0.0044
				2003	4
					0.00565
					0.009
				2004	4
					0.00575
					0.0078
				2005	2
					0.00455
					0.0046
				2006	2
					0.00665
					0.0086
				2008	5
					0.00778
					0.0115
		461141119510100	Agriculture	2000	1
					0.0016

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
		461517119402500	Agriculture	2000	0.00162
		461716119504600	Agriculture	2000	0.01471 0.02651
		461717119460600	Agriculture	2000	0.01981 0.00321
FRANKLIN	WA	12471724	Agriculture	1994	0.00322 0.007
				1995	0.0071 0.059
		12473508	Agriculture	1994	0.0591 0.009
		12473740	Agriculture	1993	0.00910 0.0207
				1994	0.0584 0.02875
				1997	0.0661 0.0042
GRANT	WA	12464606	Agriculture	1994	0.00422 0.007
		12471090	Agriculture	1994	0.0082 0.016
		12471400	Mixed	1997	0.0236 0.018233
				1998	0.04936 0.00967
				1999	0.02151 0.00587
				2000	0.005873 0.01058

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.0214
		12472380	Agriculture	1993	13
					0.028538
					0.12
				1994	2
					0.0075
					0.011
				1995	5
					0.0312
					0.12
		12472600	Mixed	1994	1
					0.005
					0.005
		12472900	Not Applicable	1997	1
					0.005
					0.005
				1999	1
					0.00391
					0.00391
				2000	1
					0.005
					0.005
		465322119333200	Agriculture	1994	1
					0.005
					0.005
		470914119445700	Agriculture	1994	1
					0.003
					0.003
KING	WA	12119795	Residential	1998	2
					0.0182
					0.02
		12128000	Urban	1996	1
					0.0059
					0.0059
				1997	2
					0.0446
					0.0745
LINCOLN	WA	12464770	Agriculture	1999	1
					0.00155
					0.00155
				2001	1
					0.00446
					0.00446
WHITMAN	WA	13351000	Mixed	1997	1
					0.011

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.011
				2003	1
					0.0292
					0.0292
				2004	1
					0.0047
					0.0047
YAKIMA	WA	12500420	Agriculture	1999	2
					0.003865
					0.00499
				2000	2
					0.00296
					0.00364
		12505410	Agriculture	1999	1
					0.00308
					0.00308
		12505450	Agriculture	1999	5
					0.002406
					0.00427
				2000	1
					0.00512
					0.00512
				2001	2
					0.00296
					0.00368
				2002	3
					0.006667
					0.0101
				2003	8
					0.009213
					0.0201
				2004	7
					0.008543
					0.0143
		12508850	Agriculture	1999	1
					0.00372
					0.00372
		461254120051300	Agriculture	2000	1
					0.00373
					0.00373
		461700119595400	Agriculture	2000	1
					0.0029
					0.0029
		462018120012000	Agriculture	2000	1
					0.00231

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
		462018120075200	Agriculture	2000	0.002312
		462023120075200	Agriculture	2003	0.002695
				2004	0.003337
		462023120075240	Not Applicable	2004	0.00625
		462046120065600	Agriculture	2000	0.017411
		462603120174200	Agriculture	2000	0.0169
		462745120192400	Agriculture	2000	0.016911
		462836120202600	Agriculture	2000	0.00298
		463228120184400	Agriculture	2000	0.002982
		463343120385400	Agriculture	2000	0.0074
BROWN	WI	04085068	Not Applicable	2004	0.008582
KEWAUNEE	WI	040853145	Not Applicable	2003	0.005251
MILWAUKEE	WI	04087000	Mixed	1994	0.012215
				1999	0.015911

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.00198
				2000	1
					0.00344
					0.00344
OUTAGAMIE	WI	04072050	Cropland	1994	1
					0.01
					0.01
WINNEBAGO	WI	04081897	Not Applicable	2003	1
					0.0049
					0.0049
PUTNAM	WV	03201300	Mixed	1997	2
					0.003955
					0.00411
BIG	WY	06279500	Mixed	1999	3
					0.00269
					0.00356
				2008	2
					0.00655
					0.0088

Table C2. Qualified Detections of Chlorpyrifos-oxon in Surface Water. Data from United States Geological Survey National Water Quality Assessment (USGS NAWQA) accessed May 21, 2010.

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
MERCED	CA	373112120382901	Not Applicable	2004	4
					0.020725
					0.020725
LOUISA	IA	05465500	Mixed	2005	1
					0.0151
					0.0151
GIBSON	IN	03374100	Mixed	2008	1
					0.0167
					0.0167
				2009	1
					0.0132
					0.0132
HANCOCK	IN	394340085524601	Cropland	2008	1
					0.021
					0.021
PERRY	IN	03303280	Not Applicable	2008	1

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
					0.0106
					0.0106
POSEY	IN	03378500	Not Applicable	2008	1
					0.0185
					0.0185
MONTGOMERY	MO	06934500	Not Applicable	2008	2
					0.0143
					0.0143
WARREN	MS	07288955	Mixed	2008	1
					0.0197
					0.0197
WASHINGTON	MS	07288650	Cropland	2008	2
					0.0459
					0.0459
DODGE	NE	06800000	Agriculture	2008	1
					0.0108
					0.0108
SARPY	NE	06805500	Mixed	2008	1
					0.0356
					0.0356
PUTNAM	OH	04186500	Cropland	2008	1
					0.0196
					0.0196
ORANGEBURG	SC	02174250	Cropland	2005	1
					0.0135
					0.0135

Table C3. Qualified Detections of Chlorpyrifos in Groundwater. Data from United States Geological Survey National Water Quality Assessment (USGS NAWQA) accessed May 21, 2010.

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
BIBB	AL	02424000	Mixed	1999	5
					0.002802
					0.00376
				2000	2
					0.00382
					0.00452
				2001	2
					0.003375
					0.00483

CHOCTAW	AL	02469762	Mixed	2000	1
					0.00331
					0.00331
JEFFERSON	AL	02423515	Urban	2001	1
					0.0022
					0.0022
		02456900	Urban	2001	1
					0.00311
					0.00311
MADISON	AL	03575100	Mixed	2002	1
					0.0041
					0.0041
MONTGOMERY	AL	02419977	Not Applicable	1999	1
					0.0035
					0.0035
				2000	2
					0.004755
					0.00481
				2001	3
					0.005903
					0.00863
PICKENS	AL	02444490	Cropland	1999	1
					0.0148
					0.0148
				2004	1
					0.0037
					0.0037
SHELBY	AL	0242354750	Urban	1999	6
					0.003108
					0.00338
				2000	3
					0.002847
					0.0029
				2001	3
					0.004303
					0.0047
				2002	1
					0.0114
					0.0114
				2003	1
					0.0024
					0.0024
				2004	1
					0.0046
					0.0046
				2005	3
					0.0041
					0.0046
				2009	1
					0.0047

					0.0047
ST CLAIR	AL	0242339580	Urban	2000	1
					0.00264
					0.00264
CARROLL	AR	07050500	Mixed	1995	1
					0.003
					0.003
PULASKI	AR	07263620	Not Applicable	1998	1
					0.00336
					0.00336
				2000	1
					0.0035
					0.0035
MARICOPA	AZ	09517000	Agriculture	2009	3
					0.007433
					0.0084
		332135112361501	Cropland	1997	2
					0.00353
					0.00353
SANTA CRUZ	AZ	09481740	Urban	2009	1
					0.0037
					0.0037
YUMA	AZ	09522000	Not Applicable	2009	2
					0.0068
					0.0087
CALIFORNIA	CA	363805119345001	Orchard/Vineyard	1993	1
					0.006
					0.006
IMPERIAL	CA	09429490	Not Applicable	1996	1
					0.0028
					0.0028
				1997	1
					0.0025
					0.0025
MERCED	CA	11260815	Mixed	2000	1
					0.00366
					0.00366
				2001	8
					0.00368
					0.0048
		11261100	Agriculture	1993	1
					0.003
					0.003
				2001	2
					0.00224
					0.00288
		11262900	Agriculture	2001	11
					0.003352
					0.0048
		11273500	Mixed	1997	2

				0.00304
				0.00352
			1998	2
				0.003665
				0.00373
			1999	1
				0.00356
				0.00356
			2000	5
				0.003278
				0.00365
			2001	16
				0.003219
				0.0048
			2002	2
				0.0021
				0.0023
			2003	1
				0.0036
				0.0036
			2004	2
				0.01995
				0.0206
			2005	4
				0.0054
				0.0068
			2006	3
				0.0054
				0.0069
			2008	2
				0.0053
				0.0063
			2009	7
				0.005371
				0.0083
	371521120390800	Mixed	1994	1
				0.003
				0.003
	371903120585400	Agriculture	2000	1
				0.00387
				0.00387
	372323120481700	Agriculture	2000	2
				0.00287
				0.0032
			2001	1
				0.003
				0.003
	372424120432800	Mixed	2000	1
				0.00308
				0.00308

		372829120420801	Not Applicable	2002	2
					0.00385
					0.0039
		373112120382901	Not Applicable	2002	1
					0.0676
					0.0676
		373115120382801	Not Applicable	2003	1
					0.0046
					0.0046
ORANGE	CA	11075610	Mixed	1998	1
					0.00228
					0.00228
				1999	2
					0.00376
					0.00378
				2001	1
					0.00463
					0.00463
RIVERSIDE	CA	11074000	Mixed	2008	1
					0.0146
					0.0146
SACRAMENTO	CA	11447360	Urban	2001	4
					0.004653
					0.00618
				2002	1
					0.0036
					0.0036
				2003	1
					0.0048
					0.0048
				2004	2
					0.01355
					0.0213
				2005	3
					0.0107
					0.0238
				2006	2
					0.00545
					0.0056
				2008	3
					0.006667
					0.0074
		11447650	Mixed	1997	1
					0.0032
					0.0032
				2000	1
					0.0032
					0.0032
				2002	1
					0.0038

					0.0038
				2003	1
					0.0037
					0.0037
				2004	1
					0.0032
					0.0032
				2005	3
					0.0053
					0.006
				2006	8
					0.005113
					0.0065
				2007	6
					0.00425
					0.0066
				2008	5
					0.00402
					0.0044
				2009	2
					0.0058
					0.0087
SAN BERNARDINO	CA	11060400	Urban	1998	1
					0.00226
					0.00226
				1999	2
					0.003055
					0.00395
SAN JOAQUIN	CA	11303500	Mixed	1994	1
					0.002
					0.002
				1998	1
					0.00304
					0.00304
				2000	11
					0.00448
					0.0117
				2001	14
					0.003411
					0.0045
				2002	7
					0.006229
					0.0179
				2003	3
					0.0042
					0.0048
				2004	4
					0.005975
					0.0074
				2005	1

					0.0044
					0.0044
				2006	4
					0.0052
					0.0062
				2007	15
					0.004973
					0.0073
				2008	10
					0.00613
					0.007
				2009	12
					0.006425
					0.0092
				2010	1
					0.0064
					0.0064
STANISLAUS	CA	11274538	Agriculture	1993	1
					0.003
					0.003
				1998	1
					0.0037
					0.0037
				2000	2
					0.003445
					0.00382
				2001	9
					0.00327
					0.00748
				2002	5
					0.0115
					0.025
				2003	3
					0.0103
					0.0224
				2004	1
					0.007
					0.007
				2005	2
					0.0058
					0.0064
				2006	2
					0.00605
					0.0076
				2010	2
					0.0052
					0.0052
		11274570	Mixed	2001	13
					0.003396
					0.00447

		11274653	Agriculture	2000	1
					0.00299
					0.00299
				2001	3
					0.0029
					0.0034
		11290000	Mixed	1993	1
					0.003
					0.003
		11290200	Mixed	2000	4
					0.003115
					0.00371
				2001	11
					0.003466
					0.00485
		11290500	Mixed	2001	5
					0.004336
					0.0049
		373621121102801	Mixed	1994	1
					0.003
					0.003
		373632121014701	Mixed	1995	2
					0.004
					0.004
		373925120550701	Agriculture	1995	1
					0.004
					0.004
				2000	3
					0.00323
					0.00349
		374209121103800	Mixed	2000	4
					0.003568
					0.00395
				2001	10
					0.002864
					0.00472
SUTTER	CA	11391100	Cropland	2001	1
					0.00154
					0.00154
DENVER	CO	06713500	Urban	2008	1
					0.0057
					0.0057
				2009	2
					0.00635
					0.0071
		06714000	Urban	1999	1
					0.00896
					0.00896
MESA	CO	09153290	Agriculture	1997	3
					0.002543

					0.00311
				1998	1
					0.00288
					0.00288
		09163500	Mixed	1997	2
					0.003115
					0.00326
				2004	1
					0.0038
					0.0038
MONTROSE	CO	09149480	Agriculture	1997	2
					0.00372
					0.00379
WELD	CO	06744000	Mixed	2001	1
					0.0021
					0.0021
		06753990	Agriculture	2003	2
					0.00425
					0.0049
		06754000	Mixed	1997	1
					0.00171
					0.00171
				2000	1
					0.00312
					0.00312
				2003	1
					0.0045
					0.0045
FAIRFIELD	CT	01209710	Urban	1997	2
					0.0034
					0.00355
				2002	1
					0.0048
					0.0048
HARTFORD	CT	01184000	Mixed	1997	1
					0.00276
					0.00276
				2000	1
					0.00238
					0.00238
				2008	2
					0.0053
					0.0056
DISTRICT OF COLUMBIA	DC	01648010	Not Applicable	2000	2
					0.005365
					0.00816
COLLIER	FL	261615081245902	Orchard/Vineyard	2009	2
					0.0068
					0.0068

DE SOTO	FL	02296750	Mixed	2001	1
					0.004
					0.004
FLORIDA	FL	262006081242602	Orchard/Vineyard	2009	1
					0.0176
					0.0176
HILLSBOROUGH	FL	280500082313502	Urban	2005	2
					0.0058
					0.0058
LEON	FL	02326838	Urban	1994	2
					0.003
					0.003
		02329000	Mixed	1994	11
					0.002364
					0.003
MIAMI-DADE	FL	252414080333200	Cropland	1997	2
					0.00325
					0.0035
				2001	1
					0.00249
					0.00249
				2002	1
					0.0037
					0.0037
PALM BEACH	FL	02281200	Cropland	1997	1
					0.00321
					0.00321
				1998	1
					0.00292
					0.00292
				2000	1
					0.00331
					0.00331
				2001	1
					0.0032
					0.0032
				2005	1
					0.0032
					0.0032
				2006	3
					0.006133
					0.0077
				2007	1
					0.0048
					0.0048
BAKER	GA	02353000	Mixed	1994	5
					0.009
					0.015
BROOKS	GA	02318500	Mixed	2000	2
					0.005085

					0.0069
				2001	1
					0.00267
					0.00267
				2003	1
					0.0033
					0.0033
				2005	1
					0.0045
					0.0045
CARROLL	GA	02338000	Mixed	1997	1
					0.00398
					0.00398
				1998	1
					0.00353
					0.00353
				2005	2
					0.0057
					0.0065
				2006	1
					0.0061
					0.0061
COBB	GA	02335860	Residential	1994	1
					0.004
					0.004
		02335864	Residential	1995	1
					0.003
					0.003
		02335865	Residential	1994	1
					0.004
					0.004
		02335869	Residential	1994	1
					0.004
					0.004
		02335870	Residential	1993	2
					0.003
					0.003
				1997	1
					0.00322
					0.00322
				2000	3
					0.003613
					0.00395
				2001	1
					0.0039
					0.0039
				2002	4
					0.00345
					0.0042
				2003	3

						0.0038
						0.0039
				2005		1
						0.0038
						0.0038
		02335910	Urban	2003		1
						0.0026
						0.0026
			Urban Count of Chlorpyrifos_ wf		1	
			Urban Average of Chlorpyrifos_ wf2		0.0026	
			Urban Max of Chlorpyrifos_ wf3		0.0026	
		02336968	Residential	2003		1
						0.0031
						0.0031
COWETA	GA	02344797	Not Applicable	2003		1
						0.0027
						0.0027
DECATUR	GA	02357000	Mixed	1994		1
						0.009
						0.009
DEKALB	GA	02336212	Urban	1995		1
						0.003
						0.003
DOUGHERTY	GA	312908084151901	Cropland	2002		2
						0.0046
						0.0046
DOUGLAS	GA	02337395	Not Applicable	2003		1
						0.003
						0.003
EARLY	GA	310427084591101	Mixed	2002		2
						0.003
						0.003
FAYETTE	GA	02344737	Not Applicable	2003		1
						0.0031
						0.0031
FULTON	GA	02335741	Residential	1995		1
						0.004
						0.004
		02335790	Residential	1995		1
						0.004
						0.004
		02336250	Urban	1995		1
						0.004
						0.004
		02336728	Urban	1995		1
						0.002
						0.002
				2003		1

					0.0026
					0.0026
GEORGIA	GA	311015084511901	Cropland	2002	1
					0.0707
					0.0707
		313502083554801	Mixed	2002	1
					0.0089
					0.0089
		320134084003703	Not Applicable	1997	1
					0.0116
					0.0116
		320135084003803	Not Applicable	1997	1
					0.00715
					0.00715
HENRY	GA	02204468	Not Applicable	2003	1
					0.0026
					0.0026
JASPER	GA	02221000	Not Applicable	2003	1
					0.0029
					0.0029
LEE	GA	02350900	Mixed	1994	1
					0.011
					0.011
MITCHELL	GA	310913084195301	Cropland	2009	2
					0.0049
					0.0049
PIKE	GA	02346358	Not Applicable	2003	1
					0.0041
					0.0041
SPALDING	GA	02344480	Not Applicable	2003	1
					0.0033
					0.0033
SUMTER	GA	02350080	Cropland	2001	1
					0.0037
					0.0037
				2003	1
					0.0031
					0.0031
				2005	1
					0.0046
					0.0046
				2007	3
					0.00543
					3
					0.0069
		320135084003902	Not Applicable	1997	2
					0.00343
					0.00343
TIFT	GA	02317797	Agriculture	1999	1
					0.00347

					0.00347
				2000	1
					0.00394
					0.00394
BENTON	IA	421705092142501	Cropland	1997	2
					0.0038
					0.0038
BREMER	IA	05420680	Cropland	2008	2
					0.0058
					0.0064
BUENA VISTA	IA	423840095135001	Mixed	2005	2
					0.0034
					0.0034
CLINTON	IA	05420500	Not Applicable	1996	1
					0.002
					0.002
				1997	2
					0.00317
					0.00376
				1999	2
					0.00733
					0.0107
				2000	1
					0.00192
					0.00192
		05422000	Mixed	1996	1
					0.0032
					0.0032
DES MOINES	IA	05474000	Mixed	1998	1
					0.0594
					0.0594
FLOYD	IA	05461390	Cropland	1998	1
					0.0031
					0.0031
HAMILTON	IA	423231093352021	Not Applicable	2007	2
					0.0044
					0.0044
		423231093352051	Not Applicable	2007	2
					0.0046
					0.0046
		423231093352052	Not Applicable	2007	2
					0.0054
					0.0054
HARDIN	IA	05451210	Cropland	2005	1
					0.0067
					0.0067
				2006	1
					0.0045
					0.0045
				2007	1

					0.0041
					0.0041
				2008	2
					0.0045
					0.0049
				2009	3
					0.0069
					0.0087
IOWA	IA	05453100	Mixed	1998	1
					0.0291
					0.0291
		420240092535001	Residential/Commercial	1997	1
					0.00509
					0.00509
		421115091250501	Cropland	1997	1
					0.00742
					0.00742
		422518092144701	Cropland	1997	1
					0.0207
					0.0207
		423419093172401	Cropland	1997	1
					0.00705
					0.00705
		424548092101701	Cropland	1997	1
					0.00568
					0.00568
		430442092402201	Residential/Commercial	1997	1
					0.00412
					0.00412
JOHNSON	IA	05454500	Not Applicable	2007	2
					0.00535
					0.0062
		05455100	Cropland	1998	1
					0.0038
					0.0038
LOUISA	IA	05465500	Mixed	1997	2
					0.02485
					0.0478
				1998	1
					0.0261
					0.0261
				2009	1
					0.0036
					0.0036
MARSHALL	IA	420347092541601	Residential/Commercial	1997	2
					0.00344
					0.00344
TAMA	IA	05464220	Cropland	1997	2

					0.00292
					5
					0.00378
WASHINGTON	IA	05455570	Cropland	1997	1
					0.004
					0.004
WRIGHT	IA	05449500	Cropland	1997	1
					0.00217
					0.00217
				2004	1
					0.0037
					0.0037
BEAR LAKE	ID	10068500	Rangeland	2001	1
					0.00441
					0.00441
ELMORE	ID	13154500	Mixed	2005	1
					0.0038
					0.0038
				2007	1
					0.0031
					0.0031
MINIDOKA	ID	424355113503201	Cropland	2005	2
					0.003
					0.003
TWIN FALLS	ID	13092747	Agriculture	2000	2
					0.00225
					0.00306
				2005	2
					0.00335
					0.0034
				2008	3
					0.00436
					7
					0.0054
ALEXANDER	IL	07022000	Not Applicable	1997	3
					0.00265
					7
					0.00304
COOK	IL	05531500	Urban	2007	6
					0.00556
					7
					0.0075
		05532500	Mixed	2003	1
					0.0049
					0.0049
IROQUOIS	IL	05525500	Cropland	2000	1
					0.00382
					0.00382
				2001	1
					0.0025
					0.0025

JERSEY	IL	05587455	Not Applicable	1997	1
					0.00365
					0.00365
LA SALLE	IL	05552500	Mixed	1996	1
					0.0027
					0.0027
		05553500	Mixed	1997	1
					0.003
					0.003
				1998	2
					0.01671
					5
					0.0303
				2000	1
					0.0037
					0.0037
				2001	1
					0.0025
					0.0025
MCDONOUGH	IL	05584500	Cropland	1997	1
					0.104
					0.104
				1998	1
					0.00382
					0.00382
PIATT	IL	05572000	Cropland	1997	5
					0.04507
					8
					0.117
				1998	1
					0.00223
					0.00223
				2008	3
					0.00473
					3
					0.0054
PULASKI	IL	03612500	Not Applicable	1996	2
					0.003
					0.0032
				1997	2
					0.00299
					0.00365
				1998	2
					0.01436
					0.025
				1999	1
					0.00301
					0.00301
				2000	2
					0.00326
					5

					0.00328
				2001	2
					0.00227
					0.00334
SCOTT	IL	05586100	Mixed	1997	2
					0.00398
					0.004
				2001	1
					0.0025
					0.0025
				2002	1
					0.0046
					0.0046
				2006	2
					0.0047
					0.0048
				2008	1
					0.0057
					0.0057
STARK	IL	05568800	Cropland	1996	1
					0.0037
					0.0037
WOODFORD	IL	05567000	Cropland	1997	1
					0.0039
					0.0039
GIBSON	IN	03374100	Mixed	1997	1
					0.00822
					0.00822
				2000	2
					0.00305
					5
					0.00347
				2003	2
					0.00315
					0.0039
				2005	1
					0.0046
					0.0046
HAMILTON	IN	395743086030501	Not Applicable	2003	1
					0.0045
					0.0045
				2005	2
					0.00375
					0.004
HANCOCK	IN	394340085524601	Cropland	2003	3
					0.00356
					7
					0.0048
				2004	2
					0.00295
					0.0047

				2006	1
					0.005
					0.005
				2008	2
					0.00625
					0.0077
MARION	IN	03353637	Urban	1992	2
					0.003
					0.003
				1993	1
					0.002
					0.002
				1997	2
					0.0032
					0.00348
				1998	1
					0.00386
					0.00386
				2001	1
					0.0019
					0.0019
PERRY	IN	03303280	Not Applicable	1996	2
					0.00375
					0.004
				1998	2
					0.00294
					0.00338
				2000	2
					0.01082
					5
					0.018
POSEY	IN	03378500	Not Applicable	1998	2
					0.03185
					0.0608
				1999	2
					0.00797
					0.0132
				2000	3
					0.00323
					0.00368
				2001	1
					0.004
					0.004
				2002	2
					0.0034
					0.0036
				2004	1
					0.0047
					0.0047
				2008	1

					0.0064
					0.0064
PUTNAM	IN	03357330	Not Applicable	2002	1
					0.0037
					0.0037
GRAY	KS	375502100363601	Agriculture	2000	2
					0.00284
					0.00284
KANSAS	KS	370130101180904	Agriculture	2000	1
					0.0184
					0.0184
		370941101540001	Agriculture	2000	1
					0.0122
					0.0122
		371909101413101	Agriculture	2000	1
					0.00684
					0.00684
GREENUP	KY	03216600	Not Applicable	1997	2
					0.00500
					5
					0.00602
				1998	3
					0.00276
					0.00348
				1999	1
					0.00342
					0.00342
				2000	2
					0.00241
					5
					0.00275
MCCRACKEN	KY	03609750	Not Applicable	1997	1
					0.00253
					0.00253
				1998	1
					0.00306
					0.00306
				1999	1
					0.00274
					0.00274
				2000	1
					0.00351
					0.00351
				2008	1
					0.0053
					0.0053
ACADIA	LA	08011020	Cropland	2000	1
					0.00273
					0.00273
		301906092272401	Cropland	2000	2
					0.00392

		302403092152300	Cropland	2000	0.00392 1
		302749092203500	Cropland	2000	0.00186 0.00186 1
ASSUMPTION	LA	073814675	Mixed	2000	0.00289 0.00289 1
EAST BATON ROUGE	LA	07379960	Urban	1999	0.00279 0.00279 1
				2000	0.00376 0.00376 5
				2001	0.00441 6 0.00602 1
				2002	0.0033 0.0033 1
				2003	0.0047 0.0047 1
IBERVILLE	LA	07381440	Cropland	1998	0.0043 0.0043 1
				2000	0.00362 0.00362 1
JEFFERSON DAVIS	LA	08012150	Mixed	2000	0.00398 0.00398 1
				2004	0.0157 0.0157 1
				2005	0.0064 0.0064 1
				2007	0.0069 0.0069 7
LAFOURCHE	LA	07381002	Cropland	1999	0.00538 6 0.0079 2
POINTE COUPEE	LA	07381495	Not Applicable	1998	0.00239 0.00328 1
					0.0077 0.0077

				2004	1
					0.0041
					0.0041
ST. LANDRY	LA	08010000	Cropland	2000	1
					0.00246
					0.00246
ST. MARY	LA	07381600	Not Applicable	2008	1
					0.0059
					0.0059
MASSACHUSETTS	MA	420309073183601	Mixed	2002	1
					0.006
					0.006
MIDDLESEX	MA	01102500	Urban	1999	1
					0.00958
					0.00958
NORFOLK	MA	01105000	Urban	2000	1
					0.00324
					0.00324
PLYMOUTH	MA	01106468	Urban	2000	1
					0.00288
					0.00288
FREDERICK	MD	01639000	Agriculture	1995	1
					0.004
					0.004
HARFORD	MD	01578310	Mixed	1996	1
					0.004
					0.004
				1997	1
					0.00225
					0.00225
				2000	1
					0.00157
					0.00157
				2001	1
					0.0012
					0.0012
				2009	1
					0.0059
					0.0059
KENT	MD	01493112	Agriculture	1999	5
					0.00307
					6
					0.00393
				2000	2
					0.00313
					0.00336
				2002	1
					0.0027
					0.0027
MACOMB	MI	04161820	Urban	1996	1

					0.004
					0.004
				1997	2
					0.00353
					0.004
				2001	1
					0.0028
					0.0028
ANOKA	MN	05288650	Not Applicable	2005	2
					0.00625
					0.0071
BLUE EARTH	MN	05320270	Agriculture	2005	1
					0.0033
					0.0033
				2006	4
					0.00452
					5
					0.0058
				2007	5
					0.0052
					0.0072
DAKOTA	MN	05331580	Mixed	1998	1
					0.00377
					0.00377
				2000	1
					0.00163
					0.00163
				2009	1
					0.0078
					0.0078
HENNEPIN	MN	05288705	Urban	1997	1
					0.00844
					0.00844
CEDAR	MO	374159093474401	Mixed	1993	2
					0.003
					0.003
MISSOURI	MO	382027092474801	Mixed	1993	1
					0.013
					0.013
STODDARD	MO	07043500	Cropland	1997	1
					0.0039
					0.0039
WARREN	MS	07288955	Mixed	2005	1
					0.0037
					0.0037
				2006	2
					0.0054
					0.0062
				2007	1
					0.0062

					0.0062
				2009	2
					0.00745
					0.0079
WASHINGTON	MS	07288650	Cropland	2006	1
					0.0044
					0.0044
				2007	2
					0.00515
					0.0055
RICHLAND	MT	06329500	Mixed	1998	2
					0.00278
					0.00288
				2000	3
					0.00185
					3
					0.00202
ROSEBUD	MT	06295000	Mixed	1999	1
					0.00177
					0.00177
				2009	1
					0.0048
					0.0048
GREENE	NC	02091500	Mixed	1997	1
					0.0033
					0.0033
				1998	2
					0.00537
					0.00805
				2000	2
					0.00265
					5
					0.00314
				2001	1
					0.0027
					0.0027
				2005	1
					0.0038
					0.0038
				2008	3
					0.0069
					0.0077
JOHNSTON	NC	0208755215	Not Applicable	2005	1
					0.0037
					0.0037
LENOIR	NC	02089500	Mixed	1997	1
					0.003
					0.003
				1998	2
					0.0033
					0.00358

				2003	1
					0.0036
					0.0036
MADISON	NC	0345292005	Agriculture	1997	1
					0.00382
					0.00382
NORTH CAROLINA	NC	361717076201301	Agriculture	1994	1
					0.006
					0.006
PITT	NC	02084160	Agriculture	1992	3
					0.003
					0.003
TRANSYLVANIA	NC	03439000	Reference	1997	1
					0.00347
					0.00347
WAKE	NC	0208726370	Not Applicable	2003	1
					0.0025
					0.0025
		0208726995	Not Applicable	2003	1
					0.0022
					0.0022
		0208732610	Not Applicable	2003	1
					0.004
					0.004
		02087580	Urban	2003	1
					0.0079
					0.0079
				2007	1
					0.0051
					0.0051
WAYNE	NC	352905077594502	Agriculture	2007	2
					0.0046
					0.0046
CASS	ND	05053800	Mixed	1995	1
					0.004
					0.004
GRAND FORKS	ND	05082625	Cropland	2000	1
					0.00257
					0.00257
PEMBINA	ND	05102490	Mixed	1994	1
					0.003
					0.003
				1999	1
					0.00345
					0.00345
COLFAX	NE	06799750	Not Applicable	2004	1
					0.0043
					0.0043
DODGE	NE	06800000	Agriculture	1998	3
					0.03553

					7
					0.0843
				1999	1
					0.0113
					0.0113
				2002	2
					0.0031
					0.0037
				2003	4
					0.00387
					5
					0.0048
				2004	2
					0.0047
					0.0047
				2005	1
					0.0031
					0.0031
				2008	7
					0.00527
					1
					0.0058
DOUGLAS	NE	06610000	Not Applicable	2002	1
					0.0037
					0.0037
				2004	1
					0.0044
					0.0044
		06800500	Mixed	2007	5
					0.00472
					0.0054
PLATTE	NE	06795500	Agriculture	2009	9
					0.00571
					1
					0.0095
SARPY	NE	06805500	Mixed	1997	2
					0.0032
					0.00384
				1999	1
					0.0586
					0.0586
				2002	1
					0.001
					0.001
				2003	1
					0.0028
					0.0028
				2004	1
					0.0045
					0.0045
				2007	1

					0.004
					0.004
				2008	2
					0.0044
					0.0044
				2009	1
					0.0076
					0.0076
HILLSBOROUGH	NH	01094161	Urban	2000	1
					0.00143
					0.00143
BERGEN	NJ	01390450	Other/Mixed	1997	1
					0.0023
					0.0023
		01390500	Residential	1996	1
					0.004
					0.004
BURLINGTON	NJ	01467000	Reference	2000	1
					0.00483
					0.00483
CAMDEN	NJ	01467150	Residential	1999	1
					0.00323
					0.00323
				2000	2
					0.00358
					0.00377
				2001	2
					0.0034
					0.0039
		393940074534201	Forest	2001	2
					0.0031
					0.0031
GLOUCESTER	NJ	01477120	Cropland	2001	1
					0.004
					0.004
MERCER	NJ	01463500	Mixed	2000	1
					0.00231
					0.00231
				2001	1
					0.0023
					0.0023
				2006	1
					0.0053
					0.0053
		01463810	Urban	2000	2
					0.00255
					0.00288
		01464500	Agriculture	1999	1
					0.00242
					0.00242

MORRIS	NJ	01381295	Commercial/Industrial	1997	1
					0.001
					0.001
		01381800	Commercial/Industrial	1997	1
					0.0036
					0.0036
SOMERSET	NJ	01403300	Mixed	1996	1
					0.0013
					0.0013
				1998	1
					0.00365
					0.00365
				2001	1
					0.0041
					0.0041
		01403900	Urban	2001	2
					0.0057
					0.008
				2004	1
					0.0114
					0.0114
				2007	1
					0.0079
					0.0079
SUSSEX	NJ	01367770	Forest	1997	1
					0.0016
					0.0016
CLARK	NV	094196783	Urban	1994	3
					0.03
					0.047
				1995	2
					0.1135
					0.16
				1998	3
					0.00356
					3
					0.0038
				1999	1
					0.0023
					0.0023
				2000	3
					0.00290
					7
					0.00386
				2001	4
					0.00290
					3
					0.00382
				2007	1

					0.0055
					0.0055
STOREY	NV	10350500	Mixed	2000	1
					0.00295
					0.00295
				2005	1
					0.0062
					0.0062
SCHENECTADY	NY	01356190	Residential	2005	1
					0.0054
					0.0054
ASHTABULA	OH	04211820	Pasture	1997	1
					0.00393
					0.00393
BUTLER	OH	03274000	Mixed	2000	1
					0.00324
					0.00324
				2001	1
					0.002
					0.002
CLERMONT	OH	03246400	Cropland	2000	1
					0.0035
					0.0035
GREENE	OH	393903083582900	Urban	2001	1
					0.0049
					0.0049
LUCAS	OH	04193500	Mixed	1997	2
					0.0038
					0.0039
				2000	1
					0.00374
					0.00374
				2001	2
					0.00335
					0.0037
				2002	1
					0.003
					0.003
				2005	1
					0.005
					0.005
				2006	6
					0.00491
					7
					0.006
				2007	4
					0.00466
					5
					0.0057
MONTGOMERY	OH	393944084120700	Urban	1999	1
					0.00173

					0.00173
				2000	1
					0.00338
					0.00338
				2001	3
					0.00423
					3
					0.0047
PUTNAM	OH	04186500	Cropland	1997	1
					0.011
					0.011
				2005	1
					0.0043
					0.0043
				2008	1
					0.0037
					0.0037
CLACKAMAS	OR	452414122213200	Not Applicable	2004	4
					0.00297
					5
					0.0046
COLUMBIA	OR	14246900	Not Applicable	1996	1
					0.0023
					0.0023
				1998	3
					0.00356
					0.004
				2000	1
					0.00348
					0.00348
				2007	2
					0.0054
					0.0056
				2008	2
					0.0058
					0.0067
				2009	1
					0.005
					0.005
				2010	2
					0.00405
					0.0061
MARION	OR	14201300	Agriculture	1996	1
					0.0037
					0.0037
				1999	1
					0.00377
					0.00377
				2000	2
					0.00302
					0.00306

				2001	3
					0.00412
					0.00484
				2002	4
					0.00397
					5
					0.0049
				2003	7
					0.00378
					6
					0.0044
				2005	1
					0.0074
					0.0074
				2006	1
					0.0073
					0.0073
				2008	5
					0.00518
					0.0062
		445551123015800	Not Applicable	2004	2
					0.00355
					0.0037
		450022123012400	Not Applicable	2003	1
					0.0019
					0.0019
				2004	2
					0.0037
					0.0044
MULTNOMAH	OR	14128910	Not Applicable	1998	1
					0.0036
					0.0036
		14211720	Mixed	1996	2
					0.003
					0.003
				1997	4
					0.00289
					3
					0.0038
				1998	4
					0.00268
					8
					0.00343
				1999	4
					0.00264
					5
					0.00365
				2000	3
					0.00487
					7
					0.0075

				2003	1
					0.0021
					0.0021
				2005	2
					0.00535
					0.0065
				2006	3
					0.0054
					0.0067
				2007	7
					0.00507
					1
					0.006
				2008	3
					0.00526
					7
					0.0055
				2009	1
					0.0063
					0.0063
WASHINGTON	OR	14206950	Urban	1995	1
					0.0023
					0.0023
				2001	5
					0.00291
					8
					0.0042
				2002	2
					0.0037
					0.0049
				2005	1
					0.0052
					0.0052
				2006	1
					0.007
					0.007
				2007	1
					0.0046
					0.0046
				2009	1
					0.0066
					0.0066
ALLEGHENY	PA	03049646	Urban	1997	1
					0.00264
					0.00264
BERKS	PA	01470779	Cropland	2000	1
					0.00261
					0.00261
		01470818	Agriculture	2000	1
					0.00344
					0.00344

		01471520	Urban	2000	1
					0.00248
					0.00248
BUCKS	PA	01462949	Urban	2000	1
					0.0014
					0.0014
		01464907	Residential	2000	1
					0.00487
					0.00487
				2001	1
					0.0037
					0.0037
CHESTER	PA	01472157	Cropland	2000	2
					0.00242
					5
					0.00258
		01480890	Urban	2000	1
					0.00192
					0.00192
DELAWARE	PA	01475510	Urban	2000	1
					0.00161
					0.00161
		01475543	Urban	2000	2
					0.0026
					0.00334
INDIANA	PA	03037525	Agriculture	1997	2
					0.0034
					0.00376
LEBANON	PA	01573095	Agriculture	1995	5
					0.004
					0.004
		401704076293101	Mixed	1995	1
					0.004
					0.004
MONTGOMERY	PA	01473470	Urban	2000	1
					0.00208
					0.00208
NORTHAMPTON	PA	01454700	Mixed	2000	1
					0.0022
					0.0022
PHILADELPHIA	PA	01474500	Mixed	2000	5
					0.00346
					8
					0.0049
				2001	1
					0.0013
					0.0013
				2002	1
					0.0049
					0.0049
PIKE	PA	01434000	Mixed	2000	1

					0.00272
					0.00272
SCHUYLKILL	PA	01555400	Agriculture	2000	3
					0.00251
					7
					0.00345
GREENVILLE	SC	021603257	Urban	1996	2
					0.0035
					0.004
ORANGEBURG	SC	02174250	Cropland	1996	8
					0.00315
					0.004
				1999	1
					0.00387
					0.00387
				2000	3
					0.00341
					3
					0.00366
				2001	3
					0.00386
					0.0048
				2005	2
					0.00505
					0.006
				2006	8
					0.00506
					3
					0.0075
				2007	1
					0.005
					0.005
				2008	4
					0.00592
					5
					0.0073
RICHLAND	SC	021695601	Urban	1996	1
					0.0018
					0.0018
		021695617	Urban	1996	1
					0.0032
					0.0032
		02169570	Urban	1996	4
					0.00327
					5
					0.0037
				2001	2
					0.00302
					0.00414
				2003	1
					0.0048

					0.0048
		335729080553901	Residential/Commercial	1996	2
					0.003
					0.003
SOUTH CAROLINA	SC	335841080582001	Residential/Commercial	1996	1
					0.0045
					0.0045
HUGHES	SD	06440000	Not Applicable	1998	1
					0.00344
					0.00344
YANKTON	SD	06467500	Not Applicable	2003	1
					0.0036
					0.0036
CLAIBORNE	TN	03528000	Mixed	1997	1
					0.0034
					0.0034
COCKE	TN	03455000	Mixed	1996	1
					0.002
					0.002
				1997	1
					0.00331
					0.00331
		03467609	Mixed	1996	2
					0.00265
					0.0033
GREENE	TN	03466208	Agriculture	1996	1
					0.002
					0.002
BEXAR	TX	08178800	Urban	1997	1
					0.00311
					0.00311
				1998	1
					0.00271
					0.00271
				2005	2
					0.00605
					0.0066
		08181800	Mixed	1997	3
					0.00348
					7
					0.00388
				2001	1
					0.00432
					0.00432
CAMERON	TX	08470400	Not Applicable	1997	1
					0.0034
					0.0034
				2003	1
					0.0035

					0.0035
				2007	1
					0.0019
					0.0019
		08475000	Not Applicable	1996	1
					0.003
					0.003
				2003	1
					0.0046
					0.0046
				2006	1
					0.0044
					0.0044
				2007	2
					0.00535
					0.0059
				2008	4
					0.00577
					5
					0.0063
				2009	3
					0.006
					0.0069
DALLAS	TX	08055500	Not Applicable	2003	1
					0.0033
					0.0033
		08057200	Urban	1998	2
					0.00369
					0.00377
				1999	2
					0.00296
					0.0032
				2000	5
					0.00640
					6
					0.0125
				2001	4
					0.00303
					8
					0.0044
				2002	4
					0.00375
					0.0048
				2003	2
					0.00465
					0.0049
				2007	1
					0.0043
					0.0043
		08057410	Mixed	1998	1
					0.0032

					0.0032
				2005	1
					0.0042
					0.0042
				2008	2
					0.0065
					0.0066
		08057448	Mixed	2000	2
					0.00302
					0.00324
DENTON	TX	08051500	Reference	1997	1
					0.00317
					0.00317
				2002	1
					0.0029
					0.0029
EL PASO	TX	08364000	Mixed	1995	1
					0.003
					0.003
				1996	3
					0.0034
					0.0038
				1997	3
					0.00325
					0.00359
				1999	1
					0.00148
					0.00148
				2000	3
					0.00296
					0.00346
				2001	2
					0.00266
					0.003
				2003	2
					0.00335
					0.0044
				2005	4
					0.00572
					5
					0.0072
				2006	9
					0.00538
					9
					0.0071
				2007	3
					0.00683
					3
					0.0076
FORT BEND	TX	08116650	Not Applicable	2008	1
					0.0075

					0.0075
KENDALL	TX	08167000	Mixed	1997	1
					0.00187
					0.00187
MEDINA	TX	08180640	Agriculture	1997	2
					0.00351
					0.00377
NAVARRO	TX	08064100	Agriculture	2006	1
					0.0062
					0.0062
PRESIDIO	TX	08374200	Not Applicable	1999	1
					0.00347
					0.00347
				2003	1
					0.0029
					0.0029
TEXAS	TX	294309099015701	Mixed	1996	1
					0.004
					0.004
		295015094440701	Mixed	1994	1
					0.005
					0.005
		325829097513601	Mixed	1994	1
					0.005
					0.005
		354918102020901	Mixed	1999	1
					0.00674
					0.00674
WEBB	TX	08459200	Not Applicable	2001	1
					0.0027
					0.0027
				2003	1
					0.0042
					0.0042
				2004	1
					0.0037
					0.0037
CACHE	UT	10102200	Agriculture	2000	1
					0.00273
					0.00273
DAVIS	UT	410041111581101	Residential	2000	1
					0.00189
					0.00189
		410342111574201	Residential	2000	1
					0.00199
					0.00199
		410453111570001	Residential	2000	1
					0.00183
					0.00183
		410501111555201	Residential	2000	1

					0.00387
					0.00387
GRAND	UT	09180500	Not Applicable	1997	1
					0.00265
					0.00265
SALT LAKE	UT	10167800	Residential	2000	1
					0.00155
					0.00155
		403927111523601	Residential	2000	1
					0.00271
					0.00271
		403945111501001	Urban	2000	1
					0.00357
					0.00357
		404000111515801	Urban	2000	1
					0.00223
					0.00223
		404143111500101	Residential	2000	1
					0.00248
					0.00248
		404349111512201	Residential	2000	1
					0.00182
					0.00182
		404430111495301	Residential	2000	1
					0.0017
					0.0017
UTAH	UT	401442111402201	Residential	2000	1
					0.00382
					0.00382
ARLINGTON	VA	01646580	Mixed	1996	1
					0.004
					0.004
FAIRFAX	VA	01654000	Urban	1995	1
					0.003
					0.003
				1997	3
					0.00333
					0.00358
				1998	2
					0.00365
					0.00373
				1999	1
					0.0037
					0.0037
				2000	2
					0.00299
					0.00387
				2003	1
					0.0042
					0.0042

				2005	1
					0.0064
					0.0064
ROCKINGHAM	VA	01621050	Agriculture	1997	3
					0.00253
					7
					0.00367
				1998	1
					0.00246
					0.00246
				2002	2
					0.00295
					0.0035
				2009	1
					0.0038
					0.0038
VIRGINIA	VA	383152078570902	Not Applicable	1994	1
					0.026
					0.026
		383202078571201	Not Applicable	1994	1
					0.005
					0.005
WISE	VA	03524550	Mining	1997	1
					0.0017
					0.0017
WYTHE	VA	03167000	Agriculture	1997	1
					0.00265
					0.00265
BENTON	WA	12509696	Agriculture	2000	1
					0.00252
					0.00252
		12510500	Mixed	2001	1
					0.00486
					0.00486
				2002	2
					0.0041
					0.0044
				2003	2
					0.00385
					0.0043
				2004	1
					0.0039
					0.0039
				2005	2
					0.00455
					0.0046
				2006	1
					0.0047
					0.0047
				2008	2

					0.00575
					0.0059
		461141119510100	Agriculture	2000	1
					0.0016
					0.0016
		461517119402500	Agriculture	2000	1
					0.00292
					0.00292
		461717119460600	Agriculture	2000	1
					0.0032
					0.0032
GRANT	WA	12471400	Mixed	1997	1
					0.00397
					0.00397
				1998	1
					0.00369
					0.00369
				2000	1
					0.00399
					0.00399
		12472380	Agriculture	1995	1
					0.003
					0.003
		12472900	Not Applicable	1999	1
					0.00391
					0.00391
		470914119445700	Agriculture	1994	1
					0.003
					0.003
KING	WA	471907122200401	Not Applicable	2005	2
					0.0051
					0.0051
LINCOLN	WA	12464770	Agriculture	1999	1
					0.00155
					0.00155
				2001	1
					0.00446
					0.00446
WHITMAN	WA	13351000	Mixed	2004	1
					0.0047
					0.0047
YAKIMA	WA	12500420	Agriculture	1999	1
					0.00274
					0.00274
				2000	2
					0.00296
					0.00364
		12505410	Agriculture	1999	1
					0.00308
					0.00308

	12505450	Agriculture	1999	4
				0.00194
				0.00315
			2001	2
				0.00296
				0.00368
			2002	1
				0.003
				0.003
			2003	3
				0.00333
				3
				0.0043
			2004	2
				0.0022
				0.0023
	12508850	Agriculture	1999	1
				0.00372
				0.00372
	461254120051300	Agriculture	2000	1
				0.00373
				0.00373
	461700119595400	Agriculture	2000	1
				0.0029
				0.0029
	462018120012000	Agriculture	2000	1
				0.00231
				0.00231
	462018120075200	Agriculture	2000	2
				0.00269
				5
				0.00333
	462023120075200	Agriculture	2003	5
				0.0034
				0.0048
			2004	3
				0.00253
				3
				0.0033
	462046120065600	Agriculture	2000	1
				0.00298
				0.00298
	462745120192400	Agriculture	2000	1
				0.00267
				0.00267
	462836120202600	Agriculture	2000	1
				0.00351
				0.00351
	463228120184400	Agriculture	2000	2
				0.00231
				0.00255

MILWAUKEE	WI	04087000	Mixed	1999	1
					0.00198
					0.00198
				2000	1
					0.00344
					0.00344
WINNEBAGO	WI	04081897	Not Applicable	2003	1
					0.0049
					0.0049
PUTNAM	WV	03201300	Mixed	1997	1
					0.0038
					0.0038
BIG HORN	WY	06279500	Mixed	1999	3
					0.00269
					0.00356
				2008	1
					0.0043
					0.0043

Table C4. Qualified Detections of Chlorpyrifos-oxon in Groundwater. Data from United States Geological Survey National Water Quality Assessment (USGS NAWQA) accessed May 21, 2010.

Country	State	Station Identification	Land Use	Year	Detection Total Average Max (ppb)
COLBERT	AL	344131087335201	Agriculture	2009	1
					0.0553
					0.0553
CAMDEN	NJ	394233074574401	Residential/ Commercial	2009	1
					0.0359
					0.0359
CALDWELL	TX	295051097274800	Mixed	2008	1
					0.0078
					0.0078

Table C5. Detections of Chlorpyrifos in Surface Water. Data from the USGS-EPA Pilot Reservoir Monitoring Program

State	Sample Description	Station Identification	Date	Detection (ppb)
LA	wsrin	315856091151900	4/29/1999	0.0081
LA	wsrout	315914091154500	4/29/1999	0.0062
LA	wsrin	315856091151900	5/13/1999	0.0054
LA	wsrout	315914091154500	5/13/1999	0.0055
LA	wsrout	315914091154500	6/2/1999	0.004
OH	wsrout	390158084090400	6/9/1999	0.0064

State	Sample Description	Station Identification	Date	Detection (ppb)
OK	wsrin	353833097211801	7/6/1999	0.0021
LA	wsrin	315856091151900	9/8/1999	0.0062
PA	wsrin	1470962	1/19/2000	0.0027
OH	wsrin	390214084081800	3/28/2000	0.0039
PA	wsrin	1470962	6/1/2000	0.0034
PA	wsrin	1470962	6/29/2000	0.0118
OH	wsrin	390214084081800	7/6/2000	0.0023
PA	wsrin	1470962	7/11/2000	0.008
MO	**wsrin**	**6907785**	**7/19/2000**	**0.0341**
PA	wsrin	1470962	8/2/2000	0.0041
OK	wsrin	353833097211801	8/2/2000	0.0043
SC	wsrin	2155401	9/6/2000	0.0023
SC	wsrin	2155401	9/11/2000	0.0018
SC	wsrin	2155401	9/20/2000	0.0025
SC	wsrin	2155401	9/26/2000	0.0024

Table C6. Chlorpyrifos Detections in Drinking Water. Total samples may include both untreated and finished water. Data taken from USDA Pesticide Data Program.

Year	Total Samples Screened	Samples with Detections	Maximum Detection
2001	283	0	0
2002	664	0	0
2003	794	0	0
2004	478	0	0
2005	462	0	0
2006	471	0	0
2007	466	0	0
2008	240	0	0

Table C7. Chlorpyrifos-oxon Detections in Drinking Water. Total samples may include both untreated and finished water. Data taken from USDA Pesticide Data Program.

Year	Total Samples Screened	Samples with Detections	Maximum Detection
2001	134	0	0
2002	381	0	0
2003	509	0	0
2004	240	0	0
2005	224	0	0
2006	236	0	0
2007	238	0	0
2008	0	0	0

Table C8. Chlorpyrifos-oxon Detections in Maumee River; National Center for Water Quality Research at Heidelberg College

Year	Number of Samples	Average Concetration of chlorpyrifos (ug/L)	Max Concetration of chlorpyrifos (ug/L)
1983	62	0.0000	0.0000
1984	88	0.0000	0.0000
1985	65	0.0000	0.0000
1986	75	0.0000	0.0000
1987	53	0.0156	0.1000
1988	41	0.0138	0.2820
1989	67	0.0028	0.0600
1990	91	0.0008	0.0460
1991	72	0.0397	2.0800
1992	85	0.4703	24.0120
1993	78	0.0859	3.9330
1994	61	0.0075	0.1740
1995	156	0.0042	0.1760
1996	164	0.0091	0.6360
1997	101	0.0062	0.0750
1998	114	0.0000	0.0000
1999	62	0.0000	0.0000
Grand Total	**1435**	**0.0379**	**24.012**

**One sample (5/2/1998) has been removed from the dataset as it was a " -1" value. Further analysis of the source will be investigated.

Table C9. Chlorpyrifos-oxon Detections in Sandusky River; National Center for Water Quality Research at Heidelberg College

Year	Number of Samples	Average Concentration of Chlorpyrifos (ug/L)	Max Concentration of Chlorpyrifos (ug/L)
1983	58	0.0000	0.0000
1984	79	0.0000	0.0000
1985	92	0.0000	0.0000
1986	75	0.0000	0.0000
1987	72	0.0739	3.8360
1988	34	0.0079	0.2250
1989	87	0.0087	0.1320
1990	90	0.0274	2.4560
1991	76	0.0488	1.5520
1992	100	0.3006	10.9160
1993	80	0.1686	6.5890
1994	66	0.0175	1.1500
1995	200	0.0067	0.3330
1996	170	0.0310	4.0000
1997	127	0.0032	0.0730
1998	120	0.0019	0.0960
1999	69	0.0410	2.8300
Grand Total	**1595**	**0.0422**	**10.916**