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OFFICE OF PREVENTION, PESTICIDES AND TOXIC SUBSTANCES

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MEMORANDUM March 11, 2002

SUBJECT: Drinking Water Reassessment for diuron and its degradates

TO: Diana Locke
Reregistration Actions Branch II
Health Effects Division (7509C)

FROM: Ibrahim Abdel-Saheb/Agronomist
Environmental Risk Branch II
Environmental Fate and Effects Division (7507C)

PEER REVIEW: Sid Abel/Environmental Scientist
Environmental Risk Branch II
Environmental Fate and Effects Division (7507C)

THRU: Tom Bailey, Branch Chief
Environmental Risk Branch II
Environmental Fate and Effects Division (7507C)

CONCLUSIONS

This memorandum transmits re-calculated estimated drinking water concentrations for use in the human health risk assessment. Griffin Label (EPA Reg. No. 1812-362) was used to determine the estimated concentrations.

The Tier II screening models PRZM[1] and EXAMS[2] were rerun using the Index Reservoir and Percent Crop Area adjustment to

determine estimated surface water concentrations of diuron and its degradates dichlorophenylmethylurea (DCPMU); dichlorophenylurea (DCPU); 3,4-dichloraniline (3,4-DCA); and N'-(3-chlorophenyl)-N-N-dimethylurea (mCPDMU). The Screening Concentration in Groundwater (SCI-GROW[3]) model was used to estimate groundwater concentrations for Diuron and its degradates. Modeling results are shown in Table 1.

Table 1. Estimated environmental concentrations in surface and groundwater for diuron and its degradates use on citrus.

Toxicity end point	model EECs (Fg/L)					use(s) modeled	PCA
	Diuron	DCPMU	DCPU	3,4-DCA	mCPDMU	one application of diuron on citrus @ 9.6 lb ai/acre, ground application	Default (0.87)
Surface water/ peak	613	130	5.80	0.08	136		
Surface water/ 1-10-year average)	128	27.0	1.20	0.02	36.4		
Surface water/ mean of annual values)	85.0	18.0	0.80	0.01	25.5		
Groundwater/ (peak and long-term average)	6.5	2.50	0.1	$2X10^{-4}$	1.38		

The IR-PCA modeling results indicate that diuron and its degradates have the potential to contaminate surface waters by runoff in areas with large amounts of annual rainfall. The degradate 3,4-DCA is commonly seen in surface water in areas with high diuron and propanil usage, however, EFED has received no guideline studies on the environmental fate and transport of 3,4-DCA or other degradate of diuron. EFED believes that additional studies are needed to fully understand both the fate and transport of these compounds in the environment.

Modeling results were higher than data from existing diuron surface water monitoring studies targeted to the pesticide use area. Modeling values where several orders of magnitude (ranging from 9-100 times) higher than monitoring data.

Major degradates that were determined by HED to be of toxicological concern include: dichlorophenylmethylurea (DCPMU),

dichlorophenylurea (DCPU), 3,4-dichloroaniline (3,4-DCA), and N'-(3-chlorophenyl)-N-N-dimethylurea (mCPDMU)]. Because the EFED lacks complete environmental fate data (such as the aerobic aquatic and anaerobic aquatic studies) on these degradates, this memorandum addresses the estimated environmental concentrations (EEC's) for surface and groundwater based on half-lives that were calculated on cumulative residues.

Usage map for diuron[4] is attached.

Surface Water

Monitoring

The EFED has targeted, but, limited monitoring data on the concentrations of diuron and its degradates in surface water.

A study on the occurrence of cotton herbicides and insecticides in Playa lakes of the high plains of western Texas concluded that diuron was the major pesticide detected in water samples collected from 32 lakes with a mean concentration of 2.7 ppb. Diuron metabolites (DCPMU, DCPU, and 3,4-DCA) were found in 71% of the samples analyzed. The mean concentrations of these metabolites were 0.45 ppb for DCPMU, 0.31 ppb for 3,4-DCA, and 0.2 ppb for DCPU[5]. In this study, water samples were taken within two days after diuron application to cotton in the region. Diuron usage on cotton in this part of the state reached an average of $1.379 lb ai/mile^2/yr. Even though, the monitoring of diuron concentrations from use on Cotton in this part of the state is an example of a targeted study, the frequency of surface water sampling and the length of sampling period were insufficient to satisfy the temporal and spatial requirements for regulatory purposes. This study has limited use in a national assessment because we do not expect western Texas to be one of the most vulnerable use areas for runoff. However, because the samples were taken within two days after application, the results may represent a lower bound of possible peak concentrations that could occur in drinking water in that area.

The US Geological Survey (USGS) National Water Quality Assessment Program (NAWQA) collected 1420 surface water samples

from 62 agricultural stream sites during the period from 1992-1998.
One to two samples was collected each month during periods when pesticide transport in the streams was expected to be low throughout the year. At most sites, the sampling frequency was increased to 1 to 3 samples per week during periods when elevated levels of pesticides were expected in the streams. Diuron was detected in 7.32% of the samples (detection limit = 0.05 ppb) with concentration of 0.13 ppb in 95% of samples. Diuron maximum concentration was 13 ppb (estimated concentration)[6].

Modeling

Tier II surface water modeling was done using the Index Reservoir (IR) and Percent Crop Area (PCA) modifications to PRZM and EXAMS.

The index reservoir represents a potential vulnerable drinking water source from a specific area (Illinois) with specific cropping patterns, weather, soils, and other factors.

The PCA is a generic watershed-based adjustment factor which represent the portion of a watershed planted to a crop or crops and will be applied to pesticide concentrations estimated for the surface water component of the drinking water exposure assessment using PRZM/EXAMS with the index reservoir scenario[7].

The IR-PCA PRZM/EXAMS model use and fate input parameters for diuron and its degradates in surface water are shown in Tables 2-6. The IR-PC PRZM/EXAMS model input and output files for diuron and its degradates are shown in Appendix I.

Table 2: IR-PC PRZM/EXAMS input parameters for diuron.		
Input variable	**Input value & calculations**	**Source/Quality of data**
Crop name	citrus	label (EPA Reg. No. 1812-362).
application rate (lb ai/acre)	9.6	label (EPA Reg. No. 1812-362).
Application efficiency	0.99	IR-PC Guidance[8]
Spray drift fraction	0.064	IR-PC Guidance
Application method	ground	label (EPA Reg. No. 1812-362).
DWRATE (day^{-1})	0.0006	MRID#41719303; Input parameters guidance[8]
DSRATE (day^{-1})	0.0006	MRID#41719303; Input parameters guidance
K_d (mL/g)	14	MRID# 44490501; Input parameters guidance
Henry ($atm.m^3/mole$)	$2.2X10^{-10}$ (calculated)	Product Chemistry chapter for HED RED, 2001.
KBACW (h^{-1})	0.0003	Aerobic aquatic met. $t_{½}$ was multiplied by 3. MRID#42260501. Input parameters guidance.
KBACS (h^{-1})	0.002	aquatic met. $t_{½}$ was multiplied by 3. MRID# MRID#42661901. Input parameters guidance.
KDP (h^{-1})	0.0007	MRID#41418805; Input parameters guidance.
KBH, KNH, KAH (h^{-1})	0 (stable)	MRID# 41418804.
KPS (mL/g)	16.6	MRID# 44490501; Input parameters guidance.

MWT (g/mole)	233.1	The MERCK INDEX[9]
Solubility @ 25 ºC (ppm)	420	Product Chemistry chapter for HED RED,2001;Input parameters guidance.
Vapor pressure (torr)	$2.0X10^{-7}$	Product Chemistry chapter for HED RED, 2001.

Table 3: IR-PC PRZM/EXAMS input parameters for DCPMU.		
Input variable	Input value & calculations	Source/Quality of data
Crop name	citrus	label (EPA Reg. No. 1812-362).
application rate (lb ai/acre)	2.03	label (EPA Reg. No. 1812-362). An equivalent value based on maximum conversion of diuron to degradates and the molecular weight ratio adjustment.
Application efficiency	0.99	IR-PC Guidance
Spray drift fraction	0.064	IR-PC Guidance
Application method	ground	label (EPA Reg. No. 1812-362).
DWRATE (day^{-1})	0.0003	MRID#41719303; Input parameters guidance[8]
DSRATE (day^{-1})	0.0003	MRID#41719303; Input parameters guidance
K_d (mL/g)	for diuron: 14	MRID# 44490501; Input parameters guidance
Henry ($atm.m^3/mole$)	for diuron: $2.2X10^{-10}$ (calculated)	Product Chemistry chapter for HED RED, 2001.
KBACW (h^{-1})	for diuron: 0.0003	No aerobic aquatic data is available, diruon- $t_{½}$ was multiplied by 3, MRID#41719303. Input parameters guidance.
KBACS (h^{-1})	for diuron: 0.002	No anaerobic aquatic data is available, the anaerobic soil met. $t_{½}$ was multiplied by 0.5. MRID#41418806. Input parameters guidance.
KDP (h^{-1})	for diuron: 0.0007	MRID#41418805; Input parameters guidance.
KBH, KNH, KAH (h^{-1})	for diuron: 0 (stable)	MRID# 41418804.
KPS (mL/g)	for diuron: 16.6	MRID# 44490501; Input parameters guidance.
MWT (g/mole)	219.1	The MERCK INDEX
Solubility @ 25 ^{0}C (ppm)	for diuron: 420	Product Chemistry chapter for HED RED,2001;Input parameters guidance.

Vapor pressure (torr)	for diuron: $2.0X10^{-7}$	Product Chemistry chapter for HED RED, 2001.

Table 4: IR-PC PRZM/EXAMS input parameters for DCPU.		
Input variable	**Input value & calculations**	**Source/Quality of data**
Crop name	citrus	label (EPA Reg. No. 1812-362).
application rate (lb ai/acre)	0.08	label (EPA Reg. No. 1812-362).An equivalent value based on maximum conversion of diuron to degradates and the molecular weight ratio adjustment.
Application efficiency	0.99	IR-PC Guidance
Spray drift fraction	0.064	IR-PC Guidance
Application method	ground	label (EPA Reg. No. 1812-362).
DWRATE (day^{-1})	0.0003	MRID#41719303; Input parameters guidance[8]
DSRATE (day^{-1})	0.0003	MRID#41719303; Input parameters guidance
K_d (mL/g)	for diuron: 14	MRID# 44490501; Input parameters guidance
Henry ($atm.m^3/mole$)	for diuron: $2.2X10^{-10}$ (calculated)	Product Chemistry chapter for HED RED, 2001.
KBACW (h^{-1})	for diuron: 0.0003	No aerobic aquatic data is available, diruon- $t_{½}$ was multiplied by 3, MRID#41719303. Input parameters guidance.
KBACS (h^{-1})	for diuron: 0.002	No anaerobic aquatic data is available, the anaerobic soil met. $t_{½}$ was multiplied by 0.5. MRID#41418806. Input parameters guidance.
KDP (h^{-1})	for diuron: 0.0007	MRID#41418805; Input parameters guidance.
KBH, KNH, KAH (h^{-1})	for diuron: 0 (stable)	MRID# 41418804.

KPS (mL/g)	for diuron: 16.6	MRID# 44490501; Input parameters guidance.
MWT (g/mole)	205.1	The MERCK INDEX
Solubility @ 25 ^{0}C (ppm)	for diuron: 420	Product Chemistry chapter for HED RED,2001;Input parameters guidance.
Vapor pressure (torr)	for diuron: $2.0X10^{-7}$	Product Chemistry chapter for HED RED, 2001.

Table 5: IR-PC PRZM/EXAMS input parameters for 3,4-DCA.		
Input variable	**Input value & calculations**	**Source/Quality of data**
Crop name	citrus	label (EPA Reg. No. 1812-362).
application rate (lb ai/acre)	0.0021	label (EPA Reg. No. 1812-362).An equivalent value based on maximum conversion of diuron to degradates and the molecular weight ratio adjustment.
Application efficiency	0.99	IR-PC Guidance[7]
Spray drift fraction	0.064	IR-PC Guidance
Application method	ground	label (EPA Reg. No. 1812-362).
DWRATE (day^{-1})	0.008	MRID#41719303; Input parameters guidance[8]
DSRATE (day^{-1})	0.008	MRID#41538701; Input parameters guidance
K_d (mL/g)	for diuron: 14	MRID# 44490501; Input parameters guidance
Henry (atm.m^3/mole)	for diuron: $2.2X10^{-10}$ (calculated)	Product Chemistry chapter for HED RED, 2001.
KBACW (h^{-1})	for diuron: 0.0003	No aerobic aquatic data is available, diruon- t ½ was multiplied by 3, MRID#41719303. Input parameters guidance.
KBACS (h^{-1})	for diuron: 0.002	No anaerobic aquatic data is available, the anaerobic soil met. t ½ was multiplied by 0.5. MRID#41418806. Input parameters guidance.

KDP (h^{-1})	for diuron: 0.0007	MRID#41418805; Input parameters guidance.
KBH, KNH, KAH (h^{-1})	for diuron: 0 (stable)	MRID# 41418804.
KPS (mL/g)	for diuron: 16.6	MRID# 44490501; Input parameters guidance.
MWT (g/mole)	162.1	The MERCK INDEX
Solubility @ 25 ºC (ppm)	for diuron: 420	Product Chemistry chapter for HED RED,2001;Input parameters guidance.
Vapor pressure (torr)	for diuron: $2.0X10^{-7}$	Product Chemistry chapter for HED RED, 2001.

Table 6: IR-PC PRZM/EXAMS input parameters for mPDMU.

Input variable	Input value & calculations	Source/Quality of data
Crop name	citrus	label (EPA Reg. No. 1812-362).
application rate (lb ai/acre)	2.04	label (EPA Reg. No. 1812-362). An equivalent value based on maximum conversion of diuron to degradates and the molecular weight ratio adjustment.
Application efficiency	0.99	IR-PC Guidance
Spray drift fraction	0.064	IR-PC Guidance
Application method	ground	label (EPA Reg. No. 1812-362).
DWRATE (day^{-1})	for diuron: 0.0006	MRID#41719303; Input parameters guidance[8]
DSRATE (day^{-1})	for diuron: 0.0006	MRID#41719303; Input parameters guidance
K_d (mL/g)	for diuron: 14	MRID# 44490501; Input parameters guidance
Henry ($atm.m^3/mole$)	for diuron: $2.2X10^{-10}$ (calculated)	Product Chemistry chapter for HED RED, 2001.
KBACW (h^{-1})	0.00008	MRID# 42661901. Input parameters guidance.

KBACS (h^{-1})	0.00005	MRID# 42260501. Input parameters guidance.
KDP (h^{-1})	for diuron: 0.0007	MRID#41418805; Input parameters guidance.
KBH, KNH, KAH (h^{-1})	for diuron: 0 (stable)	MRID# 41418804.
KPS (mL/g)	for diuron: 16.6	MRID# 44490501; Input parameters guidance.
MWT (g/mole)	198.1	The MERCK INDEX
Solubility @ 25 ºC (ppm)	for diuron: 420	Product Chemistry chapter for HED RED,2001;Input parameters guidance.
Vapor pressure (torr)	for diuron: $2.0X10^{-7}$	Product Chemistry chapter for HED RED, 2001.

Assumptions and Uncertainties[7,10]

Index Reservoir

The index reservoir represents potential drinking water exposure from a specific area (Illinois) with specific cropping patterns, weather, soils, and other factors. Use of the index reservoir for areas with different climates, crops, pesticides used, sources of water (e.g. rivers instead of reservoirs, etc), and hydrogeology creates uncertainties. In general, because the index reservoir represents a fairly vulnerable watershed, the exposure estimated with the index reservoir will likely be higher than the actual exposure for most drinking water sources. However, the index reservoir is not a worst case scenario, communities that derive their drinking water from smaller bodies of water with minimal outflow, or with more runoff prone soils would likely get higher drinking water exposure than estimated using the index reservoir. Areas with a more humid climate that use a similar reservoir and cropping patterns may also get more pesticides in their drinking water than predicted using this scenario.

A single steady flow has been used to represent the flow through the reservoir. Discharge from the reservoir also removes chemical so this assumption will underestimate removal from the

reservoir during wet periods and overestimates removal during dry periods. This assumption can both underestimate or overestimate the concentration in the pond depending upon the annual precipitation pattern at the site.

The index reservoir scenario uses the characteristics of a single soil to represent the soil in the basin. In fact, soils can vary substantially across even small areas, and this variation is not reflected in these simulations.

The index reservoir scenario does not consider tile drainage. Areas that are prone to substantial runoff are often tile drained. Tile drainage contributes additional water and in some cases, additional pesticide loading to the reservoir. This may cause either an increase or decrease in the pesticide concentration in the reservoir. Tile drainage also causes the surface soil to dry out faster. This will reduce runoff of the pesticide into the reservoir. The watershed used as the model for the index reservoir (Shipman City Lake) does not have tile drainage in the cropped areas.

EXAMS is unable to easily model spring and fall turnover. Turnover occurs when the temperature drops in the fall and the thermal stratification of the reservoir is removed. Turnover occurs again in the spring when the reservoir warms up. This results in complete mixing of the chemical through the water column at these times. Because of this inability, the Index Reservoir has been simulated without stratification. There is data to suggest that Shipman City Lake, upon which the Index Reservoir is based, does indeed stratify in the deepest parts of the lake at least in some years. This may result in both over and underestimation of the concentration in drinking water depending upon the time of the year and the depth the drinking water intake is drawing from.

Percent Crop Area Correction Factor

The PCA is a watershed-based modification. Implicit in its application is the assumption that currently-used field-scale models reflect basin-scale processes consistently for all pesticides and uses. In other words, we assume that the large field simulated by the coupled PRZM and EXAMS models is a reasonable approximation of pesticide fate and transport within a watershed that contains a drinking water reservoir. If the

models fail to capture pertinent basin-scale fate and transport processes consistently for all pesticides and all uses, the application of a factor that reduces the estimated concentrations predicted by modeling could, in some instances, result in inadvertently passing a chemical through the screen that may actually pose a risk. Some preliminary assessments made in the development of the PCA suggest that PRZM/EXAMS may not be realistically capturing basin-scale processes for all pesticides or for all uses. A preliminary survey of water assessments which compared screening model estimates to readily available monitoring data suggest uneven model results. In some instances, the screening model estimates are more than an order of magnitude greater than the highest concentrations reported in available monitoring data; in other instances, the model estimates are less than monitoring concentrations. Because of these concerns, the SAP recommended using the PCA only for "major" crops in the Midwest. For other crops, development of PCA's will depend on the availability of relevant monitoring data that could be used to evaluate the result of the PCA adjustment.

The spatial data used for the PCA came from readily-available sources and have a number of inherent limitations:

- The size of the 8-digit HUC [mean = 366,989 ha; range = 6.7-2,282,081 ha; n = 2,111] may not provide reasonable estimates of actual PCA's for smaller watersheds. The watersheds that drain into drinking water reservoirs are generally smaller than the 8-digit HUC and may be better represented by watersheds defined for drinking water intakes.
- The conversion of the county level data to watershed-based percent crop areas assumes the distribution of the crops within a county is uniform and homogeneous throughout the county area. Distance between the treated fields and the water body is not addressed.
- The PCA's were generated using data from the 1992 Census of Agriculture. However, recent changes in the agriculture sector from farm bill legislation may significantly impact the distribution of crops throughout the country. The methods described in this report can rapidly be updated as more current agricultural crops data are obtained. The assumption that yearly changes in cropping patterns will cause minimal impact needs to be evaluated.

The PCA adjustment is only applicable to pesticides applied to agricultural crops. Contributions to surface waters from non-agricultural uses such as urban environments are not well-modeled. Currently, non-agricultural uses are not included in the screening model assessments for drinking water.

The PCA does not consider percent crop treated because detailed pesticide usage data are extremely limited at this time. Detailed pesticide usage data are currently available for only a few states.

Groundwater

Monitoring

EFED has limited targeted monitoring data on the concentrations of diuron and its degradates in groundwater. Table 7 shows validated monitoring data for diuron that are available for the states of California (CA), Florida (FL), Georgia (GA), and Texas (TX).

Table 7. Groundwater monitoring data for diuron. Number of wells sampled (number of wells with residues)[11].

State	number of well	range of conc. (ppb)

CA	2010 (82)	0.05 - 3.95
FL	15385 (9)	1.18 - 5.37
GA	70 (67)	1.00 - 5.00
TX	31 (2)	0.01 - 0.02

According to the Ground Water Protection Section of the Florida Department of Environmental Protection[12], ground water samples from wells collected between May/1990 and November/1997, showed diuron detections ranging from 0.94 - 12 ppb (detection limit = 0.48 ppb). The arithmetic mean concentration was 2.44 ppb. Well water samples were collected from the following counties: Highlands, Jackson, Lake, Orange, and Polk. With the exception of the 12 ppb sample in Orange County, the majority of the detections were in Highlands County where citrus is grown. Diuron concentrations in Highlands County decreased with time to about 1 ppb but were detected every year. In Polk County, diuron concentrations show a seasonal pattern, with highest concentrations in the spring and lowest concentrations in the fall, but was not detected in all years.

The US Geological Survey (USGS) National Water Quality Assessment Program (NAWQA)[13] analyzed pesticide occurrence and concentrations for major aquifers and shallow ground water in agricultural areas (detection limit = 0.05 ppb). Analysis of 2608 samples (major aquifers study) showed diuron in 71% of the samples analyzed with a maximum concentration of 0.34 ppb. Maximum diuron concentration in 897 samples from shallow groundwater sites was 2.0 ppb, with diuron detected in only 1.23% of samples analyzed (USGS, 1998). A major component of the sampling design in the NAWQA study was to target specific watersheds and shallow ground water areas that are influenced primarily by a single dominant land use(agricultural or urban) that is important in the particular area. The ground-water data were primarily collected from a combination of production and monitoring wells. Ground-water sampling sites were sampled for pesticides from a single snap-shot in time.

Even though, the groundwater monitoring data collected by NAWQA are from sites considered typical for use areas, the frequency of sampling and the length of sampling period were not sufficient to represent the temporal and spatial requirements for regulatory purposes.

Major component of the sampling design in the NAWQA study was to target specific watersheds and shallow ground water areas that are influenced primarily by a single dominant land use(agricultural or urban) that is important in the particular area. The ground-water data were primarily collected from a combination of production and monitoring wells. Ground-water sites in the ground-water data were sampled for pesticides from a single snap-shot in time.

Modeling

The SCI-GROW model was used to estimate potential groundwater concentrations for diuron and its degradates.

Tables 8, and 9 show input parameters and output for SCI-GROW modeling of diuron and its degradates, respectively.

Table 8. Input parameters for diuron and its degradates used in the SCI-GROW model.

compound	appl. rate (lb ai/acre)	No. of appl. /year	Aerobic soil $t_{1/2}$ (d)	Koc (mL/g)	Source/Quality of data
Diuron	9.6	1	372	468	label (EPA Reg. No. 1812-362); MRID# 44490501; MRID# 41719303; Input parameters guideline (Aug. 2000). Good data.
DCPMU	2.03*	1	770	468	label (EPA Reg. No. 1812-362); MRID# 44490501; MRID# ; Input parameters guideline (Aug. 2000). Good data.
DCPU	0.08*	1	770	468	label (EPA Reg. No. 1812-362); MRID# 44490501; MRID# 41719303; Input parameters guideline (Aug. 2000). Good data.
3,4-DCA	0.0021*	1	30	468	label (EPA Reg. No. 1812-362); MRID# 44490501; MRID# 41719303; MRID# 41538701; Input parameters guideline (Aug. 2000). Good data.

mCPDMU	2.04*	1	372	468	label (EPA Reg. No. 1812-362); MRID# 44490501; MRID# 41719303; MRID# 42260501; Input parameters guideline (Aug. 2000). Good data.

*: An equivalent value based on conversion of diuron to degradates.

Table 9. SCI-GROW estimated environmental concentrations for diuron and its degradates in groundwater.

Toxicity end point	model EECs (Fg/L)					use(s) modeled
	Diuron	DCPMU	DCPU	3,4-DCA	mCPDMU	
acute	6.5	2.50	0.09	0.0002	1.38	one application of diuron on citrus @ 9.6 lb ai/acre
Chronic (non cancer)	6.5	2.50	0.09	0.0002	1.38	
Chronic (cancer)	6.5	2.50	0.09	0.0002	1.38	

The SCI-GROW screening model developed by EFED indicates that diuron and its degradates concentrations are much less than those estimated for surface water. SCI-GROW estimated concentrations of diuron do fall within the values from monitoring data shown in Table 8, but below some of the reported monitoring data. This means that SCI-GROW could underestimate chemical concentrations in typical use areas when the pesticide is used at the maximum allowed label rate in areas with ground water exceptionally vulnerable to contamination such as Florida.

Limitations of the SCI-GROW2 Analysis

The SCI-GROW model (Screening Concentrations in Ground Water) is a model for estimating concentrations of pesticides in ground water under "maximum loading" conditions. SCI-GROW provides a screening concentration, an estimate of likely ground water concentrations if the pesticide is used at the maximum allowed label rate in areas with ground water that is vulnerable to contamination. In most cases, a majority of the use area will have ground water that is less vulnerable to contamination than the areas used to derive the SCI-GROW estimate.

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APPENDIX I

IR-PCA PRZM/EXAMS

INPUT AND OUT PUT FILES FOR MODELING DIURON AND ITS DEGRADATES

DIURON

Metfile: met156a.met
PRZM scenario: FLcitrusC.txt

```
EXAMS environment file: IRPRZM0.EXV
Chemical Name:    diuron
Description Variable Name     Value Units Comments
Molecular weight  mwt   233.1 g/mol
Henry's Law Const.      henry 2.2e-10     atm-m^3/mol
Vapor Pressure    vapr  2e-7  torr
Solubility  sol   420   mg/L
Kd    Kd    16.6  mg/L
Koc   Koc         mg/L
Photolysis half-life    kdp   43    days  Half-life
Aerobic Aquatic Metabolism    kbacw 99    days  Halfife
Anaerobic Aquatic Metabolism  kbacs 15    days  Halfife
Aerobic Soil Metabolism asm   1116  days  Halfife
Hydrolysis: pH 7  0     days  Half-life
Method:     CAM   2     integer     See PRZM manual
Incorporation Depth:    DEPI  0.1   cm
Application Rate: TAPP  10.76 kg/ha
Application Efficiency: APPEFF      0.99  fraction
Spray Drift DRFT  0.064 fraction of application rate applied to pond
Application Date  Date  1-Jul 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    IR
Flag for runoff calc.   RUNOFF      total none or total(average of entire run)
```

OUTPUT FILE

```
stored as diuron.out
Chemical: diuron
PRZM environment:
FLcitrusC.txt
EXAMS environment: IRPRZM0.EXV
Metfile:
met156a.met
Water segment concentrations
(ppb)

Year     Peak     96 hr    21 Day   60 Day   90 Day   Yearly
    1948      458      439      399      333      289      123
```

1949	244	234	219	196	179	67.97
1950	325	311	281	260	237	100
1951	547	526	458	348	287	107
1952	912	873	735	540	448	187
1953	412	395	342	318	297	122
1954	528	506	472	352	316	117
1955	298	286	245	204	186	80.43
1956	373	358	318	255	215	78.67
1957	728	702	596	548	495	178
1958	249	242	219	187	182	74.4
1959	364	349	307	298	285	111
1960	721	691	641	512	422	148
1961	179	172	143	123	110	52.43
1962	315	302	270	223	194	82.85
1963	438	419	371	280	226	84.78
1964	698	669	561	433	385	146
1965	397	380	333	308	271	122
1966	248	238	205	172	154	73.71
1967	428	415	360	324	302	126
1968	328	315	286	227	213	91.01
1969	407	389	357	297	265	106
1970	284	271	232	166	135	55.88
1971	246	240	213	171	161	72.11
1972	372	360	318	277	249	89.16
1973	329	317	281	226	196	81.47
1974	321	308	265	207	175	64.67
1975	255	244	205	176	156	67.02
1976	421	408	351	274	244	101
1977	276	264	222	208	198	83.01
1978	80.59	78.02	71.26	63.29	53.82	29.89
1979	360	344	297	251	240	107
1980	407	394	359	329	292	113
1981	627	602	523	468	395	135
1982	159	154	140	116	99.89	51.04
1983	515	500	432	328	272	95.07

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.027027	912	873	735	548	495	187
0.054054	728	702	641	540	448	178
0.081081	721	691	596	512	422	148
0.108108	698	669	561	468	395	146
0.135135	627	602	523	433	385	135
0.162162	547	526	472	352	316	126

0.189189	528	506	458	348	302	123
0.216216	515	500	432	333	297	122
0.243243	458	439	399	329	292	122
0.27027	438	419	371	328	289	117
0.297297	428	415	360	324	287	113
0.324324	421	408	359	318	285	111
0.351351	412	395	357	308	272	107
0.378378	407	394	351	298	271	107
0.405405	407	389	342	297	265	106
0.432432	397	380	333	280	249	101
0.459459	373	360	318	277	244	100
0.486486	372	358	318	274	240	95.07
0.513514	364	349	307	260	237	91.01
0.540541	360	344	297	255	226	89.16
0.567568	329	317	286	251	215	84.78
0.594595	328	315	281	227	213	83.01
0.621622	325	311	281	226	198	82.85
0.648649	321	308	270	223	196	81.47
0.675676	315	302	265	208	194	80.43
0.702703	298	286	245	207	186	78.67
0.729730	284	271	232	204	182	74.4
0.756757	276	264	222	196	179	73.71
0.783784	255	244	219	187	175	72.11
0.810811	249	242	219	176	161	67.97
0.837838	248	240	213	172	156	67.02
0.864865	246	238	205	171	154	64.67
0.891892	244	234	205	166	135	55.88

```
        2
 0.91891      179      172      143      123      110    52.43
        9
 0.94594      159      154      140      116    99.89    51.04
        6
 0.97297    80.59    78.02    71.26    63.29    53.82    29.89
        3

     0.1    704.9    675.6    571.5    481.2    403.1    146.6
                                                Average  97.9047
                                                of             2
                                                yearly
                                                average
                                                s:

Inputs generaged by pe3.pl of 6-
March-2002
```

DCPMU

```
Metfile:    met156a.met
PRZM scenario:    FLcitrusC.txt
EXAMS environment file: IRPRZM0.EXV
Chemical Name:    dcpmu
Description Variable Name     Value Units Comments
Molecular weight  mwt   219.1 g/mol
Henry's Law Const.      henry 2.2e-10     atm-m^3/mol
Vapor Pressure    vapr  2e-7  torr
Solubility  sol   420   mg/L
Kd    Kd    16.6  mg/L
Koc   Koc         mg/L
Photolysis half-life    kdp   43    days  Half-life
Aerobic Aquatic Metabolism    kbacw 99    days  Halfife
Anaerobic Aquatic Metabolism  kbacs 15    days  Halfife
Aerobic Soil Metabolism asm   2310  days  Halfife
Hydrolysis: pH 7  0     days  Half-life
Method:     CAM   2     integer     See PRZM manual
Incorporation Depth:    DEPI  0.1   cm
Application Rate: TAPP  2.27  kg/ha
Application Efficiency: APPEFF      1.0   fraction
Spray Drift DRFT        fraction of application rate applied to pond
Application Date  Date  1-Jul 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 IR
Flag for runoff calc. RUNOFF total none or total(average of entire run)

OUTPUT FILE

stored as
dcpmu.out
Chemical: dcpmu
PRZM environment:
FLcitrusC.txt
EXAMS environment: IRPRZM0.EXV
Metfile:
met156a.met
Water segment concentrations
(ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1948	98.66	94.47	86.14	71.43	62.07	25.85
1949	52.57	50.36	47.23	41.74	38.15	14.1
1950	65.48	62.73	56.33	53.1	48.39	20.87
1951	112	108	94.2	71.78	59.43	22.21
1952	190	182	153	113	93.65	39.57
1953	86.07	82.4	71.37	67.13	62.65	25.77
1954	109	104	97.29	72.81	65.75	24.6
1955	61.27	58.75	50.38	42.24	38.76	16.73
1956	79.68	76.47	68.08	54.8	45.89	16.47
1957	151	146	124	115	104	37.61
1958	47.89	46.62	42.55	37.05	36.71	15.3
1959	77.23	74.06	64.7	61.96	59.14	23.24
1960	156	150	138	111	91.33	31.36
1961	37.01	35.41	29.57	25.48	23.04	10.73
1962	66.38	63.52	56.79	47.19	40.25	17.36
1963	94.8	90.73	80.33	60.6	48.85	17.88
1964	150	143	120	93.04	83.1	31.06
1965	84.8	81.22	71.32	66.26	58.58	25.91
1966	50.82	48.7	41.83	34.92	31.53	15.2
1967	89.44	86.86	75.16	67.12	63.03	26.42
1968	68.38	65.51	59.28	47.49	44.72	18.93
1969	84.68	80.99	74.32	60.54	54.31	22.22
1970	60.77	58.12	49.66	35.48	28.64	11.44
1971	52.31	50.95	45.14	35.63	32.93	15.03
1972	75.94	73.54	65.2	57.42	51.97	18.52
1973	69.77	67.2	59.36	47.76	40.62	16.85
1974	67.55	64.68	55.56	43.6	36.69	13.28
1975	49.32	47.27	39.71	34.91	31.21	13.79

1976	88.99	86.16	74.33	58.16	50.53	21.14
1977	58.23	55.76	46.95	42.43	40.52	17.26
1978	17.29	16.59	15.17	13.58	11.52	5.866
1979	74.95	71.73	61.05	52.07	50.36	22.71
1980	85.67	82.81	75.83	68.59	61.02	23.67
1981	134	128	112	100	84.85	28.61
1982	34.17	32.94	29.9	25.07	21.51	10.49
1983	108	105	90.37	68.84	57.3	19.84

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.027027	190	182	153	115	104	39.57
0.054054	156	150	138	113	93.65	37.61
0.081081	151	146	124	111	91.33	31.36
0.108108	150	143	120	100	84.85	31.06
0.135135	134	128	112	93.04	83.1	28.61
0.162162	112	108	97.29	72.81	65.75	26.42
0.189189	109	105	94.2	71.78	63.03	25.91
0.216216	108	104	90.37	71.43	62.65	25.85
0.243243	98.66	94.47	86.14	68.84	62.07	25.77
0.27027	94.8	90.73	80.33	68.59	61.02	24.6
0.297297	89.44	86.86	75.83	67.13	59.43	23.67
0.324324	88.99	86.16	75.16	67.12	59.14	23.24
0.351351	86.07	82.81	74.33	66.26	58.58	22.71
0.378378	85.67	82.4	74.32	61.96	57.3	22.22
0.405405	84.8	81.22	71.37	60.6	54.31	22.21
0.432432	84.68	80.99	71.32	60.54	51.97	21.14
0.459459	79.68	76.47	68.08	58.16	50.53	20.87
0.486486	77.23	74.06	65.2	57.42	50.36	19.84
0.513514	75.94	73.54	64.7	54.8	48.85	18.93
0.540541	74.95	71.73	61.05	53.1	48.39	18.52
0.567567	69.77	67.2	59.36	52.07	45.89	17.88

8						
0.59459	68.38	65.51	59.28	47.76	44.72	17.36
5						
0.62162	67.55	64.68	56.79	47.49	40.62	17.26
2						
0.64864	66.38	63.52	56.33	47.19	40.52	16.85
9						
0.67567	65.48	62.73	55.56	43.6	40.25	16.73
6						
0.70270	61.27	58.75	50.38	42.43	38.76	16.47
3						
0.72973	60.77	58.12	49.66	42.24	38.15	15.3
0.75675	58.23	55.76	47.23	41.74	36.71	15.2
7						
0.78378	52.57	50.95	46.95	37.05	36.69	15.03
4						
0.81081	52.31	50.36	45.14	35.63	32.93	14.1
1						
0.83783	50.82	48.7	42.55	35.48	31.53	13.79
8						
0.86486	49.32	47.27	41.83	34.92	31.21	13.28
5						
0.89189	47.89	46.62	39.71	34.91	28.64	11.44
2						
0.91891	37.01	35.41	29.9	25.48	23.04	10.73
9						
0.94594	34.17	32.94	29.57	25.07	21.51	10.49
6						
0.97297	17.29	16.59	15.17	13.58	11.52	5.866
3						
0.1	150.3	143.9	121.2	103.3	86.794	31.15
					Average of yearly averages:	20.49683

Inputs generaged by pe3.pl of 6-March-2002

DCPU

Metfile: met156a.met
PRZM scenario: FLcitrusC.txt
EXAMS environment file: IRPRZM0.EXV
Chemical Name: dcpu

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	205.1	g/mol	
Henry's Law Const.	henry	2.2e-10	atm-m^3/mol	

```
Vapor Pressure    vapr  2e-7  torr
Solubility  sol   420   mg/L
Kd    Kd    16.6  mg/L
Koc   Koc         mg/L
Photolysis half-life    kdp   43    days  Half-life
Aerobic Aquatic Metabolism    kbacw 99    days  Halfife
Anaerobic Aquatic Metabolism  kbacs 15    days  Halfife
Aerobic Soil Metabolism asm   2310  days  Halfife
Hydrolysis: pH 7  0     days  Half-life
Method:     CAM   2     integer     See PRZM manual
Incorporation Depth:    DEPI  0.1   cm
Application Rate: TAPP  0.1   kg/ha
Application Efficiency: APPEFF      0.99  fraction
Spray Drift DRFT  0.064 fraction of application rate applied to pond
Application Date  Date  1-Jul 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    IR
Flag for runoff calc.   RUNOFF      total none or total(average of entire run)
```

OUTPUT FILE

```
stored as
dcpu.out
Chemical: dcpu
PRZM environment:
FLcitrusC.txt
EXAMS environment: IRPRZM0.EXV
Metfile:
met156a.met
Water segment concentrations
(ppb)
```

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1948	4.341	4.156	3.788	3.152	2.737	1.159
1949	2.323	2.225	2.086	1.859	1.696	0.6452
1950	3.028	2.901	2.615	2.426	2.211	0.9436
1951	5.097	4.896	4.27	3.244	2.681	1.001
1952	8.496	8.137	6.848	5.031	4.181	1.757
1953	3.864	3.7	3.201	2.989	2.797	1.155
1954	4.917	4.712	4.398	3.283	2.952	1.103
1955	2.802	2.686	2.304	1.917	1.749	0.7618

1956	3.531	3.389	3.014	2.421	2.036	0.7488
1957	6.785	6.544	5.558	5.115	4.627	1.672
1958	2.314	2.252	2.039	1.744	1.701	0.6986
1959	3.428	3.287	2.879	2.786	2.672	1.045
1960	6.844	6.562	6.078	4.858	4.006	1.398
1961	1.691	1.618	1.351	1.158	1.041	0.4973
1962	2.978	2.85	2.554	2.112	1.837	0.7889
1963	4.169	3.99	3.535	2.664	2.148	0.8094
1964	6.601	6.319	5.301	4.094	3.653	1.385
1965	3.751	3.593	3.153	2.919	2.579	1.162
1966	2.325	2.228	1.919	1.609	1.443	0.6956
1967	4.002	3.888	3.369	3.025	2.826	1.184
1968	3.078	2.949	2.677	2.135	2.002	0.8574
1969	3.802	3.636	3.34	2.77	2.47	0.9989
1970	2.694	2.577	2.202	1.572	1.279	0.5299
1971	2.334	2.274	2.013	1.615	1.525	0.6873
1972	3.471	3.36	2.972	2.594	2.337	0.8386
1973	3.106	2.991	2.647	2.132	1.842	0.7682
1974	3.024	2.896	2.497	1.953	1.653	0.6105
1975	2.37	2.272	1.908	1.645	1.458	0.6315
1976	3.961	3.836	3.307	2.585	2.295	0.9525
1977	2.598	2.487	2.095	1.944	1.858	0.7839
1978	0.7702	0.7457	0.6815	0.6067	0.5158	0.2854
1979	3.38	3.235	2.787	2.357	2.264	1.022
1980	3.819	3.693	3.375	3.084	2.736	1.065
1981	5.908	5.677	4.929	4.421	3.736	1.277
1982	1.519	1.464	1.33	1.112	0.954	0.487
1983	4.822	4.683	4.045	3.074	2.555	0.895

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.027027	8.496	8.137	6.848	5.115	4.627	1.757
0.054054	6.844	6.562	6.078	5.031	4.181	1.672
0.081081	6.785	6.544	5.558	4.858	4.006	1.398
0.108108	6.601	6.319	5.301	4.421	3.736	1.385
0.135135	5.908	5.677	4.929	4.094	3.653	1.277
0.162162	5.097	4.896	4.398	3.283	2.952	1.184
0.189189	4.917	4.712	4.27	3.244	2.826	1.162
0.216216	4.822	4.683	4.045	3.152	2.797	1.159
0.243243	4.341	4.156	3.788	3.084	2.737	1.155
0.27027	4.169	3.99	3.535	3.074	2.736	1.103
0.29729	4.002	3.888	3.375	3.025	2.681	1.065

7						
0.32432	3.961	3.836	3.369	2.989	2.672	1.045
4						
0.35135	3.864	3.7	3.34	2.919	2.579	1.022
1						
0.37837	3.819	3.693	3.307	2.786	2.555	1.001
8						
0.40540	3.802	3.636	3.201	2.77	2.47	0.9989
5						
0.43243	3.751	3.593	3.153	2.664	2.337	0.9525
2						
0.45945	3.531	3.389	3.014	2.594	2.295	0.9436
9						
0.48648	3.471	3.36	2.972	2.585	2.264	0.895
6						
0.51351	3.428	3.287	2.879	2.426	2.211	0.8574
4						
0.54054	3.38	3.235	2.787	2.421	2.148	0.8386
1						
0.56756	3.106	2.991	2.677	2.357	2.036	0.8094
8						
0.59459	3.078	2.949	2.647	2.135	2.002	0.7889
5						
0.62162	3.028	2.901	2.615	2.132	1.858	0.7839
2						
0.64864	3.024	2.896	2.554	2.112	1.842	0.7682
9						
0.67567	2.978	2.85	2.497	1.953	1.837	0.7618
6						
0.70270	2.802	2.686	2.304	1.944	1.749	0.7488
3						
0.72973	2.694	2.577	2.202	1.917	1.701	0.6986
0.75675	2.598	2.487	2.095	1.859	1.696	0.6956
7						
0.78378	2.37	2.274	2.086	1.744	1.653	0.6873
4						
0.81081	2.334	2.272	2.039	1.645	1.525	0.6452
1						
0.83783	2.325	2.252	2.013	1.615	1.458	0.6315
8						
0.86486	2.323	2.228	1.919	1.609	1.443	0.6105
5						
0.89189	2.314	2.225	1.908	1.572	1.279	0.5299
2						
0.91891	1.691	1.618	1.351	1.158	1.041	0.4973
9						
0.94594	1.519	1.464	1.33	1.112	0.954	0.487
6						
0.97297	0.7702	0.7457	0.6815	0.6067	0.5158	0.2854
3						

```
      0.1   6.6562   6.3865   5.3781   4.5521    3.817   1.3889
                                              Average   0.92500
                                              of              8
                                              yearly
                                              average
                                              s:

   Inputs generaged by pe3.pl of 6-
   March-2002
```

3,4-DCA

```
Metfile:    met156a.met
PRZM scenario:    FLcitrusC.txt
EXAMS environment file: IRPRZM0.EXV
Chemical Name:    dca
Description Variable Name     Value Units Comments
Molecular weight  mwt   162.1 g/mol
Henry's Law Const.      henry 2.2e-10     atm-m^3/mol
Vapor Pressure    vapr  2e-7  torr
Solubility  sol   420   mg/L
Kd    Kd    16.6  mg/L
Koc   Koc         mg/L
Photolysis half-life    kdp   43    days  Half-life
Aerobic Aquatic Metabolism    kbacw 99    days  Halfife
Anaerobic Aquatic Metabolism  kbacs 15    days  Halfife
Aerobic Soil Metabolism asm   90    days  Halfife
Hydrolysis: pH 7  0     days  Half-life
Method:     CAM   2     integer     See PRZM manual
Incorporation Depth:    DEPI  0.1   cm
Application Rate: TAPP  0.002 kg/ha
Application Efficiency: APPEFF      0.99  fraction
Spray Drift DRFT  0.064 fraction of application rate applied to pond
Application Date  Date  1-Jul 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    IR
Flag for runoff calc.   RUNOFF      total none or total(average of entire run)
```

OUTPUT FILE

stored as
dca.out
Chemical: dca
PRZM environment:
FLcitrusC.txt
EXAMS environment: IRPRZM0.EXV
Metfile:
met156a.met
Water segment concentrations
(ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1948	0.05604	0.05366	0.04829	0.04227	0.03963	0.0168
1949	0.03089	0.02958	0.02592	0.02395	0.02129	0.008173
1950	0.05756	0.05515	0.04984	0.04374	0.03919	0.01502
1951	0.09672	0.0929	0.08095	0.06067	0.04932	0.017
1952	0.1644	0.1574	0.1324	0.09597	0.07833	0.02836
1953	0.06428	0.06155	0.05301	0.04696	0.04327	0.01666
1954	0.09236	0.08852	0.08241	0.06076	0.05219	0.01781
1955	0.04656	0.04464	0.03827	0.03056	0.02708	0.01081
1956	0.04566	0.04381	0.03866	0.03018	0.02559	0.009171
1957	0.1277	0.1231	0.1044	0.09292	0.08181	0.02749
1958	0.04567	0.04444	0.04004	0.0329	0.03033	0.0114
1959	0.057	0.05464	0.04989	0.0482	0.04557	0.01655
1960	0.08523	0.08155	0.07637	0.06018	0.04928	0.0182
1961	0.02439	0.02334	0.01953	0.01617	0.01399	0.006381
1962	0.0442	0.04229	0.03808	0.03048	0.02707	0.0104
1963	0.04797	0.04591	0.04079	0.03042	0.0245	0.009191
1964	0.09001	0.08616	0.07222	0.05433	0.04661	0.01731
1965	0.05059	0.04846	0.04221	0.03648	0.03361	0.01446
1966	0.03934	0.0377	0.03273	0.02745	0.0245	0.01027
1967	0.07425	0.07121	0.06034	0.05366	0.04746	0.0183
1968	0.05082	0.04869	0.04465	0.03509	0.03231	0.01294
1969	0.06664	0.06374	0.05879	0.0512	0.04456	0.01598
1970	0.03314	0.0317	0.02711	0.0193	0.01614	0.006882
1971	0.03197	0.03116	0.02745	0.02341	0.02274	0.009119
1972	0.06228	0.06027	0.05307	0.04418	0.03849	0.01308
1973	0.04528	0.04358	0.039	0.0319	0.02889	0.01146
1974	0.04502	0.0431	0.03754	0.02884	0.02441	0.00876
1975	0.04604	0.04412	0.03707	0.03059	0.02631	0.00974

						1
1976	0.06054	0.05868	0.0504	0.03859	0.03733	0.01404
1977	0.04515	0.04326	0.03783	0.03344	0.03137	0.01177
1978	0.00829	0.00802	0.00722	0.00610	0.00561	0.00330
	9	4	1	1	1	2
1979	0.05574	0.05335	0.04676	0.03877	0.03518	0.01331
1980	0.06207	0.06011	0.05451	0.05188	0.04513	0.01648
1981	0.08621	0.08298	0.07184	0.06153	0.05135	0.01771
1982	0.01739	0.01674	0.01527	0.01226	0.01118	0.00578
						5
1983	0.08038	0.07804	0.06737	0.05031	0.04114	0.01369

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.02702	0.1644	0.1574	0.1324	0.09597	0.08181	0.02836
7						
0.05405	0.1277	0.1231	0.1044	0.09292	0.07833	0.02749
4						
0.08108	0.09672	0.0929	0.08241	0.06153	0.05219	0.0183
1						
0.10810	0.09236	0.08852	0.08095	0.06076	0.05135	0.0182
8						
0.13513	0.09001	0.08616	0.07637	0.06067	0.04932	0.01781
5						
0.16216	0.08621	0.08298	0.07222	0.06018	0.04928	0.01771
2						
0.18918	0.08523	0.08155	0.07184	0.05433	0.04746	0.01731
9						
0.21621	0.08038	0.07804	0.06737	0.05366	0.04661	0.017
6						
0.24324	0.07425	0.07121	0.06034	0.05188	0.04557	0.0168
3						
0.27027	0.06664	0.06374	0.05879	0.0512	0.04513	0.01666
0.29729	0.06428	0.06155	0.05451	0.05031	0.04456	0.01655
7						
0.32432	0.06228	0.06027	0.05307	0.0482	0.04327	0.01648
4						
0.35135	0.06207	0.06011	0.05301	0.04696	0.04114	0.01598
1						
0.37837	0.06054	0.05868	0.0504	0.04418	0.03963	0.01502
8						
0.40540	0.05756	0.05515	0.04989	0.04374	0.03919	0.01446
5						
0.43243	0.057	0.05464	0.04984	0.04227	0.03849	0.01404
2						
0.45945	0.05604	0.05366	0.04829	0.03877	0.03733	0.01369
9						
0.48648	0.05574	0.05335	0.04676	0.03859	0.03518	0.01331
6						
0.51351	0.05082	0.04869	0.04465	0.03648	0.03361	0.01308
4						

0.54054	0.05059	0.04846	0.04221	0.03509	0.03231	0.012941
0.56756	0.04797	0.04591	0.04079	0.03344	0.03137	0.011778
0.59459	0.04656	0.04464	0.04004	0.0329	0.03033	0.011465
0.62162	0.04604	0.04444	0.039	0.0319	0.02889	0.01142
0.64864	0.04567	0.04412	0.03866	0.03059	0.02708	0.010819
0.67567	0.04566	0.04381	0.03827	0.03056	0.02707	0.01046
0.70270	0.04528	0.04358	0.03808	0.03048	0.02631	0.010273
0.72973	0.04515	0.04326	0.03783	0.03042	0.02559	0.009741
0.75675	0.04502	0.0431	0.03754	0.03018	0.0245	0.009197
0.78378	0.0442	0.04229	0.03707	0.02884	0.0245	0.009171
0.81081	0.03934	0.0377	0.03273	0.02745	0.02441	0.009119
0.83783	0.03314	0.0317	0.02745	0.02395	0.02274	0.008768
0.86486	0.03197	0.03116	0.02711	0.02341	0.02129	0.008173
0.89189	0.03089	0.02958	0.02592	0.0193	0.01614	0.006882
0.91891	0.02439	0.02334	0.01953	0.01617	0.01399	0.006381
0.94594	0.01739	0.01674	0.01527	0.01226	0.01118	0.005785
0.97297	0.008299	0.008024	0.007221	0.006101	0.005611	0.003302
0.1	0.093668	0.089834	0.081388	0.060991	0.051602	0.018238
					Average of yearly averages:	0.013439

Inputs generaged by pe3.pl of 6-March-2002

mCPDMU

Metfile: met156a.met

PRZM scenario: FLcitrusC.txt
EXAMS environment file: IRPRZM0.EXV
Chemical Name: mcpdmu
Description Variable Name Value Units Comments
Molecular weight mwt 198.1 g/mol
Henry's Law Const. henry 2.2e-10 atm-m^3/mol
Vapor Pressure vapr 2e-7 torr
Solubility sol 420 mg/L
Kd Kd 16.6 mg/L
Koc Koc mg/L
Photolysis half-life kdp 43 days Half-life
Aerobic Aquatic Metabolism kbacw 345 days Halfife
Anaerobic Aquatic Metabolism kbacs 576 days
Halfife
Aerobic Soil Metabolism asm 1116 days Halfife
Hydrolysis: pH 7 0 days Half-life
Method: CAM 2 integer See PRZM manual
Incorporation Depth: DEPI 0.1 cm
Application Rate: TAPP 2.28 kg/ha
Application Efficiency: APPEFF 0.99 fraction
Spray Drift DRFT 0.064 fraction of application rate
applied to pond
Application Date Date 1-Jul 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 IR
Flag for runoff calc. RUNOFF total none or
total(average of entire run)

OUTPUT FILE

stored as mcpdmu.out
Chemical: mcpdmu
PRZM environment:
FLcitrusC.txt
EXAMS environment: IRPRZM0.EXV
Metfile:
met156a.met
Water segment concentrations

(ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1948	111	108	102	86.4	78.22	33.14
1949	60.91	59.06	56.51	50.06	46.86	21.22
1950	76.32	74.87	66.68	65.08	61.07	29.53
1951	119	115	105	86.71	75.3	32.04
1952	195	190	168	135	118	54.72
1953	95.67	92.78	85.24	83.11	78.36	38.7
1954	118	114	109	88.57	82.88	35.84
1955	68.74	66.69	59.68	53.15	50.29	25.27
1956	83.6	81.27	75.69	65.67	57.19	23.27
1957	162	158	141	138	127	51.74
1958	59.05	57.28	52.13	48.45	48.39	24.67
1959	92.53	89.79	81.68	76.23	72.83	32.84
1960	171	166	153	132	113	42.44
1961	42.05	40.9	36.87	32.36	30.24	18.88
1962	74.52	72.24	65.92	58.63	51.84	24.17
1963	99.64	96.57	87.58	71.68	60.47	24.47
1964	154	150	132	111	102	41.51
1965	96.46	93.56	84.25	80.25	73.51	36.7
1966	59.13	57.35	51.49	44.58	41.52	23.24
1967	102	100	90.1	81.31	78.51	36.13
1968	78.5	76.13	70.05	60.24	58.09	28.19
1969	98.14	95.15	89.14	73.68	69.28	32.32
1970	65.69	63.67	56.86	44.59	37.25	18.31
1971	61.32	60.14	55.32	45.3	42.69	21.55
1972	82.3	79.84	73.47	68.58	64.48	26.28
1973	79.14	77.09	70.54	59.86	52.46	24.44
1974	73.61	71.37	63.83	53.37	46.59	19.75
1975	55.5	53.83	47.46	43.92	40.71	20.22
1976	98.21	95.81	86.64	72.98	64.27	29.55
1977	70.17	68.07	60.24	53.74	52.06	25.53
1978	21.38	20.81	18.84	17.6	15.52	10.4
1979	85.11	82.5	72.57	64.65	63.74	30.6
1980	99.32	96.8	91.78	82.6	76.45	33.65
1981	140	136	124	118	105	39.45
1982	39.57	38.59	35.96	31.95	28.43	17.34
1983	112	110	99.33	82.58	72.24	28.12

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.027027	195	190	168	138	127	54.72
0.054054	171	166	153	135	118	51.74
0.081081	162	158	141	132	113	42.44
0.108108	154	150	132	118	105	41.51

0.135135	140	136	124	111	102	39.45
0.162162	119	115	109	88.57	82.88	38.7
0.189189	118	114	105	86.71	78.51	36.7
0.216216	112	110	102	86.4	78.36	36.13
0.243243	111	108	99.33	83.11	78.22	35.84
0.27027	102	100	91.78	82.6	76.45	33.65
0.297297	99.64	96.8	90.1	82.58	75.3	33.14
0.324324	99.32	96.57	89.14	81.31	73.51	32.84
0.351351	98.21	95.81	87.58	80.25	72.83	32.32
0.378378	98.14	95.15	86.64	76.23	72.24	32.04
0.405405	96.46	93.56	85.24	73.68	69.28	30.6
0.432432	95.67	92.78	84.25	72.98	64.48	29.55
0.459459	92.53	89.79	81.68	71.68	64.27	29.53
0.486486	85.11	82.5	75.69	68.58	63.74	28.19
0.513514	83.6	81.27	73.47	65.67	61.07	28.12
0.540541	82.3	79.84	72.57	65.08	60.47	26.28
0.567568	79.14	77.09	70.54	64.65	58.09	25.53
0.594595	78.5	76.13	70.05	60.24	57.19	25.27
0.621622	76.32	74.87	66.68	59.86	52.46	24.67
0.648649	74.52	72.24	65.92	58.63	52.06	24.47
0.675676	73.61	71.37	63.83	53.74	51.84	24.44
0.702703	70.17	68.07	60.24	53.37	50.29	24.17
0.729730	68.74	66.69	59.68	53.15	48.39	23.27
0.756757	65.69	63.67	56.86	50.06	46.86	23.24
0.783784	61.32	60.14	56.51	48.45	46.59	21.55
0.810811	60.91	59.06	55.32	45.3	42.69	21.22
0.837838	59.13	57.35	52.13	44.59	41.52	20.22

8						
0.86486	59.05	57.28	51.49	44.58	40.71	19.75
5						
0.89189	55.5	53.83	47.46	43.92	37.25	18.88
2						
0.91891	42.05	40.9	36.87	32.36	30.24	18.31
9						
0.94594	39.57	38.59	35.96	31.95	28.43	17.34
6						
0.97297	21.38	20.81	18.84	17.6	15.52	10.4
3						
0.1	156.4	152.4	134.7	122.2	107.4	41.789
					Average of yearly averages:	29.3394 4

Inputs generaged by pe3.pl of 6-March-2002

APPENDIX II

SCI-GROW

OUTPUT FILES FOE MODELING DIURON AND ITS DEGRADATES

RUN No. 1 FOR diuron INPUT VALUES

APPL (#/AC) RATE	APPL. NO.	URATE (#/AC/YR)	SOIL KOC	SOIL METABOLISM	AEROBIC (DAYS)

```
      9.600      1       9.600      468.0      372.0

   GROUND-WATER SCREENING CONCENTRATIONS IN PPB
   -------------------------------------------------------
                    6.521987
   -------------------------------------------------------
  A=   367.000  B=   473.000  C=     2.565  D=     2.675
RILP=     3.399
  F=     -.168  G=      .679  URATE=     9.600  GWSC=
6.521987
```

```
   RUN No.   1 FOR DCPMU                INPUT VALUES

-----------------------------------------------------------------
---
    APPL (#/AC)  APPL.  URATE    SOIL    SOIL  AEROBIC
    RATE          NO. (#/AC/YR)  KOC   METABOLISM (DAYS)

-----------------------------------------------------------------
---
      2.030      1       2.030      468.0      770.0

   GROUND-WATER SCREENING CONCENTRATIONS IN PPB
   -------------------------------------------------------
                    2.497237
   -------------------------------------------------------
  A=   765.000  B=   473.000  C=     2.884  D=     2.675
RILP=     3.821
  F=      .090  G=     1.230  URATE=     2.030  GWSC=
2.497237
```

```
   RUN No.   2 FOR DCPU                 INPUT VALUES

-----------------------------------------------------------------
---
```

APPL (#/AC) RATE	APPL. NO.	URATE (#/AC/YR)	SOIL KOC	SOIL METABOLISM (DAYS)	AEROBIC
.080	1	.080	468.0	770.0	

GROUND-WATER SCREENING CONCENTRATIONS IN PPB

.098413

A= 765.000 B= 473.000 C= 2.884 D= 2.675
RILP= 3.821
F= .090 G= 1.230 URATE= .080 GWSC= .098413

RUN No. 3 FOR 3,4-DCA INPUT VALUES

APPL (#/AC) RATE	APPL. NO.	URATE (#/AC/YR)	SOIL KOC	SOIL METABOLISM (DAYS)	AEROBIC
.002	1	.002	468.0	30.0	

GROUND-WATER SCREENING CONCENTRATIONS IN PPB

.000155

A= 25.000 B= 473.000 C= 1.398 D= 2.675
RILP= 1.852
F= -1.111 G= .077 URATE= .002 GWSC= .000155

RUN No. 4 FOR mCPDMU INPUT VALUES

```
-----------------------------------------------------------------
---
    APPL (#/AC)  APPL.  URATE    SOIL    SOIL  AEROBIC
    RATE          NO. (#/AC/YR)  KOC   METABOLISM (DAYS)

-----------------------------------------------------------------
---
      2.04        1     2.04      468.0      372


   GROUND-WATER SCREENING CONCENTRATIONS IN PPB
   -------------------------------------------------------
                     1.3827
   -------------------------------------------------------
  A=   110.000  B=   473.000  C=     2.041  D=     2.675
RILP=     2.705
  F=     -.591  G=      .257  URATE=     1.120  GWSC=
.287307
```