



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

OFFICE OF  
CHEMICAL SAFETY AND  
POLLUTION PREVENTION

May 26, 2011  
PC Code: 044312  
DP Bar Code: D389034

**MEMORANDUM**

**SUBJECT:** Emergency Exemption (Section 18) Dinotefuran Drinking Water Assessment for Use on Pome Fruit and Stone Fruit to Control the Brown Marmorated Stink Bug (BMSB) (*Halyomorpha halys*)

**TO:** Marcel Howard  
Risk Integration, Minor Use & Emergency Response Branch  
Registration Division (7505P)

**FROM:** Ronald Parker, Ph.D., Senior Environmental Engineer  
Environmental Risk Branch III  
Environmental Fate and Effects Division (7507P)

*Ronald D. Parker*  
05/26/2011

**THROUGH:** Dana Spatz, Chief  
Katrina White, Acting Risk Assessment Process Leader  
Environmental Risk Branch III  
Environmental Fate and Effects Division (7507P)

*Katrina White*  
5/26/2011

**Executive Summary**

This memo summarizes the Environmental Fate and Effects Division's (EFED) Section 18 drinking water risk assessment for use on pome fruit and stone fruit to control the brown marmorated stink bug (BMSB).

The Virginia Department of Agriculture & Consumer Services has taken the lead in requesting an Emergency Exemption (Section 18) to control a BMSB infestation in pome fruit and stone fruit in Virginia, Delaware, North Carolina, West Virginia, Pennsylvania, New Jersey and Maryland. This section 18 would permit use of dinotefuran to control this infestation in all seven states.

Estimated Drinking Water Concentrations (EDWCs) simulated with the EFED FIRST model for the proposed new uses are approximately 20% higher than the EDWCs calculated previously by EFED. Table 1 below includes new concentrations for both parent dinotefuran and for the same four degradates of toxicological concern that were

included in the previous drinking water assessment. Use on pome and stone fruits resulted in peak and annual average (chronic) surface water EDWC of 91.31 and 25.16 µg/L, respectively.

Estimated surface water concentrations were higher than groundwater concentrations. Use on pome and stone fruits resulted in an estimated groundwater concentration of 3.5 µg/L.

Both parent and degradate concentrations change linearly and equally with the application rate. Each degradate concentration in this assessment have been calculated by assuming a constant parent /degradate concentration ratio. Concentrations for degradates in groundwater have been adjusted relatively to the new SCIGROW concentration for dinotefuran on pome & stone fruits and on turfgrass.

This is a tier I exposure assuming that peak concentrations for the parent and all four degradates occur simultaneously.

Crop (Scenario)	Percent Cropped Area (PCA)	Acute (peak) Surface Water Concentration (ppb)	Annual Average Surface Water Concentration (ppb)	Ground Water Concentration (ppb)
Pome and Stone Fruit (0.304 lbs ai/A, 2 applications, 7 day interval, airblast)	100% <sup>2</sup>	58.07	9.54	1.91
Turf Grass (0.54 lb ai/A, 1 application, aerial)	100% <sup>2</sup>	49.8	8.2	1.71
<b><u>Degradates</u></b>				
MNG	100% <sup>3</sup>	4.65	1.96	0.59 (p&s) 0.53 (turf)
DN	100% <sup>2</sup>	9.36	4.00	0.13 (p&s) 0.12 (turf)
UF	100% <sup>2</sup>	4.91	2.49	0.22 (p&s) 0.20 (turf)
DN-2-OH <sup>3</sup>	100% <sup>2</sup>	14.32	7.17	0.65 (p&s) 0.58 (turf)
Parent + All Degradates (Pome & Stone Fruits) (Assuming All Peaks Occur Simultaneously)	100% <sup>2</sup>	<b>91.31</b>	<b>25.16</b>	<b>3.5</b>

<sup>1</sup> Parent residues are for the parent compound alone.

<sup>2</sup> [http://www.epa.gov/oppefed1/models/water/pca\\_adjustment\\_dwa.html](http://www.epa.gov/oppefed1/models/water/pca_adjustment_dwa.html)

<sup>3</sup> DN-2-OH represents DN-2-OH+DN-3-OH. These two were reported as one metabolite in the study.

**Proposed Application Rate and Method Information for Use of Dinotefuran to Control the Brown Marmorated Stink Bug (BMSB) on Pome Fruit and Stone Fruit**

The proposed maximum application amounts and methods for BMSB control are two foliar applications which range from 0.263 to 0.304 pound per acre at a minimum spacing of 7 days. See Table 2 below.

**Table 2. Proposed Label Usage Information for Control of BMSB Pome & Stone Fruit**

Source	Maximum Single Application Rate (lbs ai/A)	Maximum Number of Applications	Minimum Application Interval	Methods of Application
Venom Label (VA)	0.302	2 (based on 0.604 lb ai/A/season)	7	Foliar, Air or ground spray
Venom Label (DE)	0.263	2 (based on 0.526 lbs ai/season)	7	Foliar, Air or ground spray
Scorpion Label (DE, MD, NJ, NC, PA, VA, and WV) <sup>1</sup>	0.304	2 (based on 0.608 lbs ai/A/season)	7	Foliar spray, ground application

<sup>1</sup>The VA application recommends applications occur between April 15 and October 15.

**ENVIRONMENTAL FATE CHARACTERIZATION**

Dinotefuran has a molecular weight of 202.2 g/mole, a very high water solubility (39,830 ppm), and a low octanol/water partition coefficient ( $K_{ow} = 0.283$ ), suggesting the potential for runoff and low bioaccumulation. The low vapor pressure ( $1.275 \times 10^{-8}$  mm Hg) and a low Henry's Law Constant ( $8.63 \times 10^{-14}$  Atm • M<sup>3</sup>/mol) suggest that this compound is not expected to volatilize substantially from water or soils in natural environment. The following environmental fate assessment for Dinotefuran was based on the data submitted by the registrant to support the environmental fate data requirements for terrestrial food crop uses. The Environmental fate and physico-chemical properties of Dinotefuran are listed in the Table 3 below.

**Table 3. Summary Results of Environmental Fate and Physiochemical Parameters for Dinotefuran**

Parameter	Value	Reference/ Comments
<b>Selected Physical Chemical Parameters</b>		
Chemical Classification	Nitroguanidine	
Pesticide Classification	Systemic Insecticide	
Molecular Weight	202.2 g/mol	MRID # 45640101
Water Solubility (20°C)	39,830 ppm	MRID# 45640112
Vapor pressure (30°C)	<1.275x10 <sup>-8</sup> mm Hg	MRID# 45640105
Henry's Law Constant	8.63 x 10 <sup>-14</sup> Atm m <sup>3</sup> /mol	Calculated
Octanol/Water Partition, K <sub>ow</sub>	0.283	MRID # 45639702
log K <sub>ow</sub>	-0.549	MRID # 45639702
<b>Abiotic and Biotic Degradation</b>		
Hydrolysis t <sub>1/2</sub>		
Parent	pH 4 (50°C) pH 7 (50°C) pH 9 (50°C) pH 11 (50°C) pH 13 (50°C)	~stable ~stable ~48 days 1.9 days 0.18 days
Parent	pH 4 (25°C) pH 7 (25°C) pH 9 (25°C)	stable stable stable No major degradates at 25°C.
MNG	pH 4, 7, and 9 (51°C)	stable
DN-Phosphate	pH 4, 7, and 9 (50°C)	stable Transformation products were not confirmed for dinotefuran at high temperatures.
Photolysis t <sub>1/2</sub>	in water	
Parent		Invalid study 1.8 days (pH 7 buffer solution) Major products: UF, MG hydrogen chloride, DN-2-OH, DN-3-OH, BCDN succinate, CO <sub>2</sub> , Minor Product : DN
Photolysis t <sub>1/2</sub>	in water	
MNG		2.4 days (assuming 12-hr light/dark cycle) in pH 7.1-7.2 buffer solution. Major products: G (max. 50.6% @ 6.8 days), MU (max. 18.6% @ 6.8 days). Minor Products: NG, and MG
Photolysis t <sub>1/2</sub>	in water	
DN-Phosphate	pH 5  pH 7  pH 9	53.4 days (12-hr light/dark cycle); major product: MG; 533.2 days (12-hr. light/dark cycle), minor product: MG; stable
Photolysis t <sub>1/2</sub>	in soil	
parent		Dinotefuran is persistent to soil photolysis
Photolysis t <sub>1/2</sub>	in air	
parent		Unacceptable study

**Table 3. Summary Results of Environmental Fate and Physicochemical Parameters for Dinotefuran**

Parameter	Value	Reference/Comments
Aerobic Soil metabolism $t_{1/2}$ parent	US Soil - LS 87.7 days, major degradate MNG (max. 14.5% @ 181 days) Five US soils, half-lives range: 17 - 89 days, major degradates MNG (max. 24.0% @ 42 days) and NG (max. 14.3% @ 42 days) Switzerland SiL - 16 days; major degradate MNG (max. 15.6% @ 28 d)	MRID# 45640112 and 46751101 (a) <del>MRID# 45640111 (s)</del> MRID# 46711201 (s)
Aerobic Soil metabolism $t_{1/2}$ MNG	$t_{1/2}$ = 67 days for the SiL, 166 days for the SL, and 73 days for the CiL, major degradate NG (25.7% @ study termination or 120 days)	MRID# 46711202 (s)
Aerobic Soil metabolism $t_{1/2}$ NG	At study termination (98 days) in nitrogen-treated soils, mineralized N levels were 37%, 46% and 63% for the SL, SiL and SiL, respectively, at the 100 $\mu\text{g N/g}$ soil rate and 6%, 10% and 15%, respectively, at the 500 $\mu\text{g N/g}$ soil rate.	MRID# 46751103 (s)
Anaerobic Soil metabolism $t_{1/2}$ parent	SiL soil from Switzerland 62 days; water 51 days, major degradate-DN (max. 29.2% @ 120 days)	MRID# 45891616 (s)
Aerobic Aquatic metabolism $t_{1/2}$ parent	Study using two radiolabeled materials: 79.3 days (total river system); 76 days (total pond system); major degradate: DN [max. 23.1% (17.6% in sediment + 5.5% in water) @ 180d in river system and 32.6% (31.1% in sediment + 1.5% in water) @ 103d in pond system]	MRID # 45640117 (s)
Anaerobic Aquatic metabolism $t_{1/2}$ parent	Study using radiolabeled material. 51 days (water), 62 days (soil); major degradate: none in water phase.	MRID# 45891616 (s)
<b>Mobility</b>		
Mobility in Soils Parent - Dinotefuran	<u>Parent</u>	L - Loam; SL - Sandy Loam; CL - Clay Loam; LS - Loamy Sand; SiL - Silty Loam; C - Clay  MRID# 45640114 (a)
	Soil Source $K_d$ $K_{oc}$	
	L US III 1.01 42	
	SL US I 0.71 45	
	CL US (MN) 1.22 42	
	LS Germany 0.12 6	
	SiL France 0.22 22	
	<u>Parent (screening study conducted at one concentration)</u>	
	Soil Source $K_d$ $K_{oc}$	
	CL Japan 0.60 23.3	MRID# 45640115 (s)
	L Japan 0.38 31.4	
	C Japan 1.12 33.6	
	LS Japan 0.38 25.3	
Mobility in Soils	Soil Source $K_d$ $K_{oc}$	MRID# 45640116 (s)

**Table 3. Summary Results of Environmental Fate and Physiochemical Parameters for Dinotefuran**

Parameter	Value				Reference/ Comments
MNG	L	US III	0.75	31	
	SL	US I	0.12	8	
	CL	US (MN)	0.70	24	
	LS	Germany	0.16	8	
	SiL	France	0.16	16	
Mobility in Soils DN-Phosphate	Soil	Source	$K_d$	$K_{oc}$	MRID# 45640113 (s)
	L	US III	2.08	87	
	SL	US I	2.07	58	
	CL	US (MN)	72.54	2502	
	SL	Germany	2.93	413	
	C	Switzerland	7.11	270	
<b>Terrestrial Field Dissipation</b>					
Terrestrial Field Dissipation parent	CA (SL) $t_{1/2}$ = 65.2 days MNG (degradate) was detected in 0-15 cm soil at 31.5% @ 45 days after 2nd application. GA (SL) $t_{1/2}$ = 19.4 days MNG was detected in 0-15 cm soil at 5.3% max. mean concentration after 7 and 30 days after the 2 <sup>nd</sup> application. NY (SL) $t_{1/2}$ = 55.9 days MNG was detected in 0-15 cm soil at 6.6% @ 45 and 120 days after the <u>second application</u> . Applied 2X @ 0.268 lb a.i/A @ 14-day interval to bare soil.				MRID# 45640118 (a)
<b>Bioaccumulation</b>					
Accumulation in Fish, max. BCF	NA				Waived ( $K_{ow}$ = 0.28)
* (a) = acceptable study that fulfills guideline requirement; (s) = supplemental study; (u) = unacceptable study; NA=Not Available; N/A=Not Applicable					

The major route of dissipation for dinotefuran appears to be aqueous photolysis (half-life 1.8 days) and leaching. Since there is no valid soil photolysis data, it is unknown if dinotefuran parent residues break down quickly in soil via photolysis. Dinotefuran appears to be relatively persistent to metabolism, both in aerobic (half-life = 17-89 days) and anaerobic (half-life = 51-62 days) conditions. It appears that under metabolic conditions, dinotefuran degrades to MNG and subsequently to NG. Dinotefuran is stable to hydrolysis in a range of pH's of 4-9. It is considered to be very highly mobile ( $K_{oc}$  = 6 – 45 L/kg. $_{oc}$ ) in various soil types. It is also very highly soluble (39,830 ppm). Since dinotefuran may persist in soils, it may have a high potential to leach to subsurfaces. Furthermore, it can migrate to adjacent bodies of water through spray drift and in runoff events, probably dissolved in the water column. Once in the rivers, ponds, or other bodies of water, the fate of dinotefuran is somewhat uncertain. Aqueous photolysis should be important in clear and shallow bodies of water; however, in deep ponds or rivers or flowing bodies of water, it is more likely to dissipate via dissolution, and subsequently via metabolism.

## Degradates of Dinotefuran (See Figure 1, below)

There were six major transformation products identified in the laboratory studies (MNG, DN, UF, MG-HCl, DN-2-OH + DN-3-OH, and BCDN succinate). The degradate MNG was identified as a major product in aerobic soil metabolism and in the terrestrial field dissipation studies. The degradate, DN, was identified as a major product in anaerobic soil metabolism and aerobic aquatic metabolism studies.

As indicated earlier, it appears that the major route of dissipation for dinotefuran is aqueous photolysis (half-life 1.8 days), with the formation of multiple photolysates. Due to the fast dissipation of dinotefuran by aqueous photolysis, there is a likelihood that it may also dissipate via soil photolysis, but no data are available at this time. The photolysis half-life of a major transformation product, MNG, in a pH 7 buffer was 2.4 days, assuming a 12-hour light/dark cycle. A separate aqueous photolysis study of DN-phosphate, another transformation product of dinotefuran, in pH 7 buffer, resulted in an extrapolated half-life of 533 days assuming a 12-hour light/dark cycle.

DN phosphate (1-methyl-3-(tetrahydro-3-furylmethyl)guanidinium dihydrogen phosphate) was identified as a degradation product of dinotefuran in photodegradation in soil (MRID 45640109), photodegradation in water (MRID 45640106, 45640105) and anaerobic soil metabolism (MRID 45891616) studies. Although the phosphorus is not an elemental constituent of parent dinotefuran, DN phosphate was formed as a salt of orthophosphate and 1-methyl-3-(tetrahydro-3-furylmethyl)guanidinium. Because the DN phosphate salt will dissociate in soil and aquatic environments to form (1-methyl-3-(tetrahydro-3-furylmethyl)guanidinium) and phosphoric acid, it is not expected to alter the environmental fate or toxicity of the organic moiety of DN phosphate (1-methyl-3-(tetrahydro-3-furylmethyl)guanidinium).

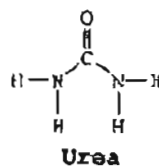
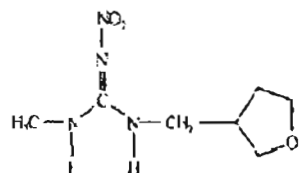
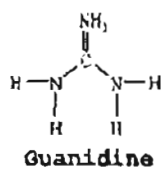
MNG contains the nitro guanidine structure and therefore is considered to possess similar toxicity as the parent. DN is also structurally similar to the parent and therefore considered to share similar toxicity as the parent. None of the dinotefuran degradates are expected to have any higher toxicity than the parent (HED Memo of 01/20/04. L. Cheng, D293759).

Dinotefuran, and its degradates, MNG and DN-phosphate are highly soluble in water (39,830 ppm, 11,480 ppm and 619,400 ppm, respectively). Similar to the parent compound MNG and DN are stable to hydrolysis and have high metabolic persistence. DN-phosphate, a salt of DN, was used by the registrant in lieu of DN, because it is a stable substance, to conduct laboratory studies. The other degradates were mostly photolysates.

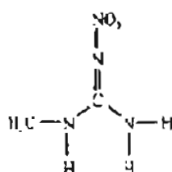
The batch equilibrium - adsorption/desorption studies conducted on the parent and major degradates MNG and DN-phosphate, indicate that the parent dinotefuran, and MNG are very highly mobile ( $K_{oc} < 50$  L/kg), while DN is slightly to highly mobile.  $K_{oc}$  values for dinotefuran ranged from 6 to 45 L/kg for eight soils tested (four from Japan and four domestic).  $K_{oc}$  values for MNG ranged from 8 to 31 L/kg for five domestic and foreign soils. The study on DN-phosphate yielded a wide range of  $K_{oc}$  values (between 58 and 2502 L/kg).

In field dissipation studies dinotefuran was sprayed twice (at 14-day interval) using ground application equipment at three different sites (California, Georgia, and New York) at an application rate of 0.268 lb a.i./A/application. Rainfall was supplemented with irrigation to exceed the 10-year average rainfall at each test site. All soils were silt loams. The soil pHs at these sites ranged from 6.5 (GA) to 8.8 (CA). The half-lives of dinotefuran were 65.2 days (CA), 19.4 days (GA), and 55.9 days (NY), indicating moderate persistence for the parent. These results are in agreement with the results observed in the laboratory. In these field studies, the degradate MNG was the only one detected in substantial amounts. At the California site, MNG was 31.5% of the applied at 45 days after the second application in the 0-15 cm soil depth. MNG was also detected at lower concentrations at the GA (5.3%) and NY (6.6%) sites. Even though the field studies did not show substantial leaching, EFED believes that leaching of both dinotefuran, and MNG are highly possible and may have gone undetected.

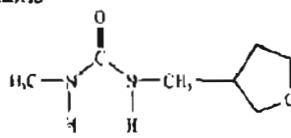




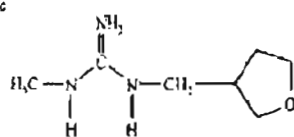
**1-methyl-2-nitro-3-(tetrahydro-3-furylmethyl) guanidine**



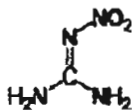
**1-methyl-2-nitroguanidine**



**1-methyl-3-(tetrahydro-3-furylmethyl)urea**



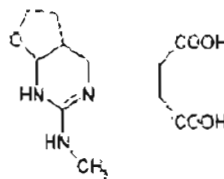
**1-methyl-3-(tetrahydro-3-furylmethyl) guanidine**



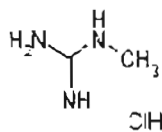
**Nitroguanidine**



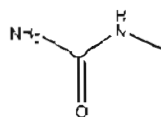
**Phosphate**



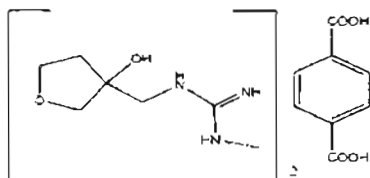
**3-(Methylamino-9-oxa-2-aza-4-azoribicyclo[4.3.0]non-3-ene hydroxy succinate**



**1-Methylguanidinium chloride**



**4-Methylurea**



**Bis[1-(3-hydroxytetrahydro-3-furylmethyl)-3-methylguanidinium] terephthalate**

**Figure 1. Dinotefuran and dinotefuran degradates (MTI-466)**

## 1. Drinking Water Exposure Modeling.

EFED used the FQPA Index Reservoir Screening Tool (FIRST) model for this tier I drinking water exposure assessment. SciGrow was used to estimate concentrations in groundwater. Two of the possible application scenarios were simulated: an airblast application of 0.304 pounds per acre (Scorpion® label) and an aerial application of 0.302 pounds per acre (Virginia Venom® label). A single application of 0.54 pounds per acre on turf grass was also simulated. A summary of selected environmental fate and effects parameters for dinotefuran as used as modeling inputs is presented in Table 4.

<b>Environmental Fate Parameter</b>	<b>Value</b>	<b>Justification</b>	<b>Source</b>
Water Solubility	39,830 mg/L	Measured value	MRID 45640112
Organic Carbon Partition Coefficient ( $K_{oc}$ ; mL/g)	30.1 (FIRST) 6 (SciGrow)	FIRST: Represents the mean of the following values: 42, 45, 42, 6, 22, 23.3, 31.4, 33.6, 25.3 mL/g for the parent compound.  SciGrow: represents the lowest value	MRID 45640114, 45640115
Aerobic Soil Metabolism Half-life (days)	68 (FIRST) 38 (SciGrow)	FIRST: Represents the 90 <sup>th</sup> percentile confidence bound on the mean half-life value of the following values: 87.7, 38, 17, 78, 89, 20, 15.9 days (four or more values)  SciGrow: Median value	MRID 45640111, 45640112 / 46751101, 46711201
Aerobic Aquatic Metabolism Half -life (days)	82.73	Represents the 90 <sup>th</sup> percentile confidence bound on the mean half-life. Two available values: 79.3 and 76.0 days: mean=77.65 days; standard dev.= 2.3335 days	MRID 45640117
Aqueous Photolysis Half-life (days)	1.8	Single Available Value	MRID 45640105

## Drinking Water Exposure Modeling Results

FIRST and SciGrow Model estimated drinking water exposure concentrations are shown in Table 5.

Crop (Scenario)	Acute (peak) Surface Water Concentration (ppb)	Annual Average Surface Water Concentration (ppb)	Ground Water Concentration (ppb)
Pome and Stone Fruit (0.304 lbs ai/A, 2 app., 7 day interval, airblast)	58.07	9.54	1.92
Pome and Stone Fruit (0.302 lb ai/A, 2 app., 7 day interval, aerial)	57.59	9.46	1.91
Turf Grass (0.54 lb ai/A, 1 app., aerial)	49.8	8.2	1.71

The maximum acute estimated drinking water concentration (EDWC) value from the simulation is 58.07 ppb and the maximum chronic (annual average) EDWC is 9.54 ppb. The maximum ground water concentration for pome and stone fruits as estimated with the SCIGROW model is 1.91 ppb. See results in FIRST and SciGrow model output files in Appendix A below.

The previous maximum EDWC parent dinotefuran values were 48.2 ppb, 8.0 ppb and 2.75 ppb respectively, in the original drinking water assessment (Revised Section 3 Environmental Risk Assessment for the Registration of Dinotefuran on Leafy Vegetable, Turfgrasses, Ornamentals and Residential Use) dated June 30, 2004 (See 044312 D285633 S3NC). Maximum modeling concentrations from that document were as follows in Table 6.

<b>Table 6.0. Previous Tier I Estimated Drinking Water Concentrations for Turf</b>			
Chemical	Acute (peak) Surface Water Concentration (ppb)	Annual Average Surface Water Concentration (ppb)	Ground Water Concentration (ppb)
Parent Dinotefuran	48.20	8.00	2.75
<b>Degradates</b>			
MNG	3.86	1.63	0.86
DN	7.77	3.32	0.19
UF	4.07	2.07	0.32
DN-2-OH <sup>1</sup>	11.88	5.95	0.94

1 - DN-2-OH represents DN-2-OH+DN-3-OH. These two were reported jointly as one metabolite in the study.

## Appendix A.

FIRST model (Tier 1) and SCIGROW output for use of dinotefuran on pome & stone fruits for control of BMSB infestation in VA, DE, NC, WV, PA, NJ, and MD.  
 (Note: Results are shown for use on turf because previous modeling applied a PCA to turf uses and the turf uses resulted in the highest EDWCs in both surface and ground water.)

### FIRST Model

```

RUN No.  1 FOR dinotefuran  ON pome & stone fruit * INPUT VALUES *
-----
RATE (#/AC)  No.APPS &  SOIL  SOLUBIL  APPL TYPE  %CROPPED  INCORP
ONE(MULT)    INTERVAL    Koc  (PPM )  (%DRIFT)  AREA      (IN)
-----
0.304( 0.587)  2  7    30.1 39830.0  ABLAST( 6.3) 100.0  0.0
    
```

#### FIELD AND RESERVOIR HALFLIFE VALUES (DAYS)

```

-----
METABOLIC  DAYS UNTIL  HYDROLYSIS  PHOTOLYSIS  METABOLIC  COMBINED
(FIELD)    RAIN/RUNOFF (RESERVOIR) (RES.-EFF)  (RESER.)  (RESER.)
-----
68.00      2           N/A         1.80- 223.20  82.73    60.36
    
```

#### UNTREATED WATER CONC (MICROGRAMS/LITER (PPB)) Ver 1.1.1 MAR 26, 2008

```

-----
PEAK DAY (ACUTE)      ANNUAL AVERAGE (CHRONIC)
CONCENTRATION          CONCENTRATION
-----
58.072                 9.537
    
```

```

RUN No.  2 FOR dinotefuran  ON pome & stone fruit * INPUT VALUES *
-----
RATE (#/AC)  No.APPS &  SOIL  SOLUBIL  APPL TYPE  %CROPPED  INCORP
ONE(MULT)    INTERVAL    Koc  (PPM )  (%DRIFT)  AREA      (IN)
-----
0.302( 0.583)  2  7    30.1 39830.0  AERIAL(16.0) 100.0  0.0
    
```

#### FIELD AND RESERVOIR HALFLIFE VALUES (DAYS)

```

-----
METABOLIC  DAYS UNTIL  HYDROLYSIS  PHOTOLYSIS  METABOLIC  COMBINED
(FIELD)    RAIN/RUNOFF (RESERVOIR) (RES.-EFF)  (RESER.)  (RESER.)
-----
68.00      2           N/A         1.80- 223.20  82.73    60.36
    
```

#### UNTREATED WATER CONC (MICROGRAMS/LITER (PPB)) Ver 1.1.1 MAR 26, 2008

```

-----
PEAK DAY (ACUTE)      ANNUAL AVERAGE (CHRONIC)
CONCENTRATION          CONCENTRATION
-----
57.587                 9.466
    
```

```

RUN No.  3 FOR Dinotefuran  ON Turf Grass * INPUT VALUES *
-----
RATE (#/AC)  No.APPS &  SOIL  SOLUBIL  APPL TYPE  %CROPPED  INCORP
ONE(MULT)    INTERVAL    Koc  (PPM )  (%DRIFT)  AREA      (IN)
-----
.504( .504)  1  1    30.1 39830.0  AERIAL(16.0) 100.0  .0
    
```

FIELD AND RESERVOIR HALFLIFE VALUES (DAYS)

METABOLIC (FIELD)	DAYS UNTIL RAIN/RUNOFF	HYDROLYSIS (RESERVOIR)	PHOTOLYSIS (RES.-EFF)	METABOLIC (RESER.)	COMBINED (RESER.)	
68.00	2	N/A	1.80-	223.20	82.70	60.34

UNTREATED WATER CONC (MICROGRAMS/LITER (PPB)) Ver 1.1.0 JAN 1, 2007

PEAK DAY (ACUTE) CONCENTRATION	ANNUAL AVERAGE (CHRONIC) CONCENTRATION
49.780	8.181

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

SciGrow version 2.3  
 chemical:Dinotefuran  
 crop: pome and stone fruit  
 time is 5/20/2011 9: 9: 5

Application rate (lb/acre)	Number of applications	Total Use (lb/acre/yr)	Koc (ml/g)	Soil Aerobic metabolism (days)
0.304	2.0	0.608	6.00E+00	38.0

groundwater screening cond (ppb) = 1.92E+00  
 \*\*\*\*\*

SciGrow version 2.3  
 chemical:Dinotefuran  
 crop: pome & stone fruits  
 time is 5/23/2011 12:51:12

Application rate (lb/acre)	Number of applications	Total Use (lb/acre/yr)	Koc (ml/g)	Soil Aerobic metabolism (days)
0.302	2.0	0.604	6.00E+00	38.0

groundwater screening cond (ppb) = 1.91E+00  
 \*\*\*\*\*

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

SciGrow version 2.3  
 chemical:Dinotefuran  
 crop:Turfgrass  
 time is 5/23/2011 12:53:12

Application rate (lb/acre)	Number of applications	Total Use (lb/acre/yr)	Koc (ml/g)	Soil Aerobic metabolism (days)
0.540	1.0	0.540	6.00E+00	38.0

groundwater screening cond (ppb) = 1.71E+00  
 \*\*\*\*\*