Appendix F. TerrPlant

Model: **TerrPlant**

Version: 1.2.2

Date: 12/26/2006

Contact: This spreadsheet was developed by the Plant Technical Team (PTT) of the Environmental Fate and Effects Division (EFED). For more information or assistance, please contact the PTT Co-Chairs.

Description: TerrPlant is used by EFED as a Tier 1 model for screening level assessments of pesticides. The purpose of this model is to provide estimates of exposure to terrestrial plants from single pesticide applications. The model does not consider exposures to plants from multiple pesticide applications. TerrPlant derives pesticide EECs in runoff and in drift. RQs are developed for non-listed and listed species of monocots and dicots inhabiting dry and semi-aquatic areas.

Documentation: Equations for EEC calculations are located in table 3 of the model spreadsheet. Please see user manual for model description, including conceptual model, input parameter guidance, assumptions, uncertainties and references. Click on the hyperlink below.
..\User Guide\TerrPlant_v1.2.2_User Guide.doc

Past Versions: (date) 1.0 (October 16, 2002)
1.2.1 (November 9, 2005)

Version Update Notes:

1) In 2005, TerrPlant was modified to v1.2.1 in order to remove an assumption that aerial applications result in 60% application efficiency. TerrPlant v1.2.1 and v1.2.2 assume 100% efficiency in ground and aerial applications (USEPA 2005). Note that application efficiency is considered separately from spray drift; where the sum of the two does not necessarily equal 100%.

2) v1.2.2 represents a cosmetic update of v1.2.1. The EECs and RQs are the same when comparing outputs of the two versions. No model assumptions or equations were altered from v1.2.1.

3) v1.2.2 automates the derivation of EECs by allowing the user to indicate the drift assumption. This results in direct calculation of EECs relevant to the application method and form. The previous version did not allow the user to select drift assumptions. This resulted in calculation of EECs which were not relevant to the pesticide being modeled. For example, if a user was modeling a liquid pesticide applied by ground, v1.2.1 automatically calculated EECs and RQs for pesticides applied by aerial methods. The model also calculated EECs and RQs for the pesticide assuming it was a granular form. For v1.2.2, the default assumptions for spray drift are 1% for ground and 5% for aerial methods.

4) v1.2.1 incorrectly indicated that the user should input the incorporation depth in terms of units of cm. v1.2.2 corrects the units reference to inches.

5) Current guidance indicates that drift EECs should be compared to the more sensitive measure of effect: either seedling emergence or vegetative vigor. v1.2.2 derives RQs for non-listed species exposed to drift by automating the selection of the lowest EC_{25} value for both monocots and dicots when comparing the two endpoints. It then selects the corresponding NOAEC value for monocots and dicots for derivation of RQs for listed species exposed to drift.

Notes to User:

1) In cases where multiple application methods (ground and aerial/airblast/spray chemigation) and/or application forms (liquid and granule) are possible for a pesticide, multiple drift fractions are possible for a pesticide. This impacts the calculation of EECs of that pesticide. To calculate the different EECs and resulting RQs for the different possible drift fractions, the user should complete the following steps: A) input all relevant data for the pesticide according to one relevant type of application method and form (Tables 1, 2 and 4); B) copy the worksheet within the Excel file; C) alter the relevant application method and/or form to represent another application scenario; and D) repeat as necessary.

2) In cases where a pesticide label allows for multiple applications, the single highest application rate should be modeled. If the single highest application rate is lower than the maximum annual application rate, the maximum annual rate should not be modeled.

Artichokes Output

TerrPlant v. 1.2.2
Green values signify user inputs (Tables 1, 2 and 4).
Input and output guidance is in popups indicated by red arrows.

Table 1. Chemical Identity.	
Chemical Name	**Propyzamide**
PC code	**101701**
Use	**Artichokes**
Application Method	**Aerial**
Application Form	**Spray**
Solubility in Water (ppm)	**15**

Table 2. Input parameters used to derive EECs.			
Input Parameter	**Symbol**	**Value**	**Units**
Application Rate	A	**4.08**	**y**
Incorporation	I	**1**	none
Runoff Fraction	R	**0.02**	none
Drift Fraction	D	**0.05**	none

Table 3. EECs for Propyzamide. Units in y.		
Description	**Equation**	**EEC**
Runoff to dry areas	(A/I)*R	0.0816
Runoff to semi-aquatic areas	(A/I)*R*10	0.816
Spray drift	**A*D**	**0.204**
Total for dry areas	**((A/I)*R)+(A*D)**	**0.2856**
Total for semi-aquatic areas	**((A/I)*R*10)+(A*D)**	**1.02**

Table 4. Plant survival and growth data used for RQ derivation. Units are in y.				
	Seedling Emergence		**Vegetative Vigor**	
Plant type	**EC_{25}**	**NOAEC**	**EC_{25}**	**NOAEC**
Monocot	**0.03**	**0.015**	**0.088**	**0.0001**
Dicot	**0.015**	**0.004**	**0.0104**	**0.0079**

Table 5. RQ values for plants in dry and semi-aquatic areas exposed to Propyzamide through runoff and/or spray drift.*				
Plant Type	**Listed Status**	**Dry**	**Semi-Aquatic**	**Spray Drift**
Monocot	non-listed	9.52	34.00	6.80
Monocot	listed	19.04	68.00	13.60
Dicot	non-listed	19.04	68.00	19.62
Dicot	listed	71.40	255.00	25.82
*If RQ > 1.0, the LOC is exceeded, resulting in potential for risk to that plant group.				