

## ABSTRACT

Brink, P.J., van den, M.M.S. ter Horst, W.H.J. Beltman, J. Vlaming & H. (Rik) van den Bosch,, 2005. PRIMET version 1.0, manual and technical description. A Decision Support System for assessing Pesticide Risks in the tropics to Man, Environment and Trade.. Wageningen, Alterra, Alterra-Report 1185. 60 blz. 25 figs.; 1 tables.; 17 refs.

Pesticide exposure via for instance spray drift or runoff to surface water, accumulation in the topsoil, and leaching to groundwater potentially affects organisms in water and soil and might also pose risks to humans via dietary exposure, in case they consume contaminated aquatic products like groundwater, macrophytes and fish. To estimate these risks at the household level the PRIMET Decision Support System was developed. PRIMET runs with a minimum of input data and is developed to be used in developing countries. The risk assessment is expressed in Exposure Toxicity Ratio's which are calculated by dividing the predicted exposure by the safe concentration. This report provides a mathematical description of the processes incorporated into PRIMET and a user manual. PRIMET is freely available at [www.primet.wur.nl](http://www.primet.wur.nl).

**Keywords:** Developing Countries, Pesticides, Human Health, Risk Assessment, Tropics, Vegetables

ISSN 1566-7197

This report can be ordered by paying € 10,- to bank account number 16 70 54 613 in name of Alterra Wageningen. IMAK number NL17 RABO 0000 0000 0012 Swift number RABOZNLX. Please mention Alterra Report 1185. This amount includes the delivery (postage) and handling costs.

© 2005 Alterra

P.O. Box 47; 6700 AA Wageningen; The Netherlands

Phone: + 31 317 474700; fax: +31 317 419000; e-mail: [info.alterra@wur.nl](mailto:info.alterra@wur.nl)

No part of this publication may be reproduced or published in any form or by any means, or stored in a database or retrieval system without the written permission of Alterra.

Alterra assumes no liability for any losses resulting from the use of the research results or recommendations in this report.

## Contents

Preface	9
Summary	11
1 Introduction	13
2 Incorporated processes and calculations	15
2.1 Introduction	15
2.2 Aquatic risk assessment	15
2.2.1 Aquatic exposure assessment	15
2.2.1.1 Limitations of approach	15
2.2.1.2 Steps in calculating the aquatic exposure	16
2.2.1.3 Temperature dependent pesticide parameters	16
2.2.1.4 Calculation of the overall dissipation rate coefficient	17
2.2.1.5 Calculation of PEC <sup>1</sup> <sub>water</sub> for one application	20
2.2.1.6 Calculation of PEC <sup>n</sup> <sub>water</sub> for multiple applications	22
2.2.2 Aquatic effect assessment	22
2.2.3 Aquatic risk assessment	23
2.2.4 List of parameters needed for the aquatic risk assessment	23
2.2.4.1 Input watercourse parameters	23
2.2.4.2 Input pesticide parameters	23
2.2.4.3 Input pesticide application parameters	24
2.2.4.4 (Possible) constant parameters	24
2.2.4.5 Calculated parameters	24
2.3 Terrestrial risk assessment	25
2.3.1 Terrestrial exposure assessment	25
2.3.2 Terrestrial effect assessment	26
2.3.3 Terrestrial risk assessment	26
2.3.4 List of parameters needed for the terrestrial risk assessment	26
2.3.4.1 Input soil scenario parameters	26
2.3.4.2 Input pesticide parameters	26
2.3.4.3 Input pesticide application parameters	27
2.3.4.4 (Possible) constant parameters	27
2.3.4.5 Calculated parameters	27
2.4 Groundwater risk assessment	27
2.4.1 Groundwater exposure assessment	27
2.4.2 Groundwater effect assessment	28
2.4.3 Groundwater risk assessment	28
2.4.4 Parameters groundwater risk assessment	29
2.4.4.1 Input soil scenario parameters	29
2.4.4.2 Input pesticide parameters	29
2.4.4.3 Input pesticide application parameters	29
2.4.4.4 (Possible) constant parameters	29

2.4.4.5 Calculated parameters	29
2.5 Dietary risk assessment	30
2.5.1 Dietary exposure assessment	30
2.5.1.1 Considered food items and diet	30
2.5.1.2 Consumption via drinking water	30
2.5.1.3 Consumption via fish	30
2.5.2 Consumption via macrophytes	31
2.5.2.1 Consumption via vegetables	32
2.5.2.2 Calculation of Estimated Daily Intake	32
2.5.3 Dietary effect assessment	33
2.5.4 Dietary risk assessment	33
2.5.5 Parameters dietary risk assessment	33
2.5.5.1 Input diet scenario parameters	33
2.5.5.2 Input pesticide parameters	34
2.5.5.3 Input pesticide application parameters	34
2.5.5.4 (Possible) constant parameters	34
2.5.5.5 Calculated parameters	34
3 User manual	35
3.1 Getting Started	35
3.1.1 The start screen of PRIMET	35
3.1.2 Menu's in the menu bar	35
3.1.2.1 File	36
3.1.2.2 Tools	36
3.1.2.3 View	37
3.1.2.4 Help	37
3.1.3 The toolbar	37
3.1.4 The selection panel	37
3.2 The Home screen	37
3.2.1 Database	38
3.2.2 Manage PRA	38
3.2.3 Selection	39
3.2.4 Assessments	40
3.3 Input to a PRA	41
3.3.1 General	41
3.3.2 Pesticide	42
3.3.3 Application Scheme	44
3.3.4 The physical scenario Aquatic	45
3.3.5 Terrestrial	46
3.3.6 Groundwater	47
3.3.7 Dietary	48
3.4 Output of a PRA	50
3.4.1 Output via the Home screen; the Results screen	50
3.4.2 Output via the Compare button	52
3.5 Options	54
3.5.1 Button Options	55
3.5.2 Button Variables	55
3.5.3 Button Legend	56

3.5.4 Button Help	56
3.5.5 Button About	56
3.5.6 Button Exit	57
Literature	59