

CONTENTS

Foreword	9
List of authors	12
List of participants	13
Session 1: General introduction	
Systems approaches and ecological modernisation of horticultural production systems R. Rabbinge, W.A.H. Rossing and P.S. Wagelmakers	19
Directions in modelling fruit growth and orchard processes T.A. Atkins	31
Session 2: Fruit growth and quality	
Modelling fruit set, fruit growth and dry matter partitioning L.F.M. Marcelis and E. Heuvelink	39
A simulation peach growth model at the shoot bearing fruit level: fruit growth variability and reserve kinetics M. Ben Mimoun, F. Lescourret, M. Génard and R. Habib	51
Simulation of the effect of fruit thinning on peach quality M. Génard, F. Lescourret and M. Ben Mimoun	61
Progress in the development of 'CITROS' - a dynamic model of citrus productivity A. Bustan, E.E. Goldschmidt and Y. Erner	69
Examination of 'hierarchical' and 'proportional' dry matter partitioning models with potted citrus trees A. Bustan and E.E. Goldschmidt	81
Modifying <i>PEACH</i> to model the vegetative and reproductive growth of almonds G. Esparza, T.M. DeJong and Y.L. Grossman	91
Model of fruit growth based on biophysical description of main contributing processes S. Fishman and M. Génard	99
Using the relation between growing degree hours and harvest date to estimate run-times for <i>PEACH</i> : a tree growth and yield simulation model M. Ben Mimoun and T.M. DeJong	107

Validating an apple dry matter production model with whole canopy gas exchange measurements in the field A.N. Lakso, R.M. Piccioni, S.S. Denning, F. Sottile and J. Costa Tura	115
Modelling chemical thinning in peach E. Szafran, Z. Kizner, I. David and S. Zilkah	123
Modelled seasonal pattern of nitrogen requirements of mature, cropping peach trees (<i>Prunus persica</i> (L.) Batsch) J. Rufat and Th.M. DeJong	129
Analysis and modelling of apple fruit growth S. Orlandini, M. Moriondo, P. Cappellini and P. Ferrari	137
Session 3: Critical assessment of modelling approaches	
Quality of modelling in fruit research and orchard management: an introduction to the workshop W.A.H. Rossing, W. van der Werf and C. Leeuwis	147
Quality of modelling in fruit research and orchard management: issues for discussion W. van der Werf, C. Leeuwis and W.A.H. Rossing	151
'IRRY': a decision support system for the water supply in orchards A.J. Boshuizen and M.P. van der Maas	161
Recommendations for an efficient plant protection programme in Swiss apple orchards: current state and future development of a decision support system B. Graf, H. Höhn, W. Siegfried, H.U. Höpli and E. Holliger	167
A decision support system for economic and ecological calculations for fruit crops M.J. Groot	171
Computer-methodology for designing pest sampling and monitoring programs W. van der Werf, J.P. Nyrop, M.R. Binns and J. Kovach	175
Vinemild: an application-oriented model of <i>Plasmopara viticola</i> epidemics on <i>Vitis vinifera</i> Ph. Blaise, R. Dietrich and C. Gessler	187
'PEACH': peach crop yield and tree growth simulation model for research and education T.M. DeJong	193
Modelling mite dynamics on apple trees in eastern North America J.M. Hardman, W. van der Werf and J.P. Nyrop	201

Modelling peach response to chemical thinning E. Szafran, S. Zilkah and Z. Kizner	211
Quality of modelling in fruit research and orchard management: report of a discussion W.A.H. Rossing, C. Leeuwis and W. van der Werf	213
Session 4: Tree architecture	
'SIMTECK': a SImlation Model for TEChnical operations in Kiwifruit orchard management R. Habib, D. Agostini and F. Lescourret	229
A pollination and fertilisation model for multi-seeded fruit and its application to kiwifruit. F. Lescourret, B. E. Vaissière and J. Chadoeuf	237
'WINTREE': a computer program for calculating chill and anthesis units used in modelling fruit tree phenology R. Rojas-Martinez, S.D. Seeley, J.L. Anderson, J.W. Frisby and J.I. del Real-Laborde	245
Session 5: Pest management	
A new demand function for grapevine fruits in vinemild Ph. Blaise, R. Dietrich and M. Jermini	253
A simulation study with a Dutch and a Canadian strain of the parasitoid <i>Aphelinus mali</i> (Hald.) for control of woolly apple aphid <i>Eriosoma lanigerum</i> (Hausmann) in the Netherlands P.J.M. Mols and J.M. Boers	261
Session 6: Orchard management	
3D digitizing based on tree topology : application to study the variability of apple quality within the canopy E. Costes, H. Sinoquet, C. Godin and J.J. Kelner	271
A statistical approach for analyzing sequences in fruit tree architecture Y. Guédon and E. Costes	281
Computational model for direct solar irradiation of canopy in dense orchard E.E. Gussakovskiy and Y. Shahak	289
Modelling light interception on the basis of sunfleck measurements P.S. Wagelmakers and M. Tazelaar	297