

## LIST OF CONTENTS

Foreword	viii
Preface	x
List of contents	xi
List of authors	xix

## INTERNATIONAL SYMPOSIUM ON EVALUATION OF CULTIVARS, ROOTSTOCKS AND MANAGEMENT SYSTEMS FOR SUSTAINABLE PRODUCTION OF DECIDUOUS FRUIT CROPS

### Breeding strategies and cultivar evaluation

Advances in cultivar and rootstock breeding: a case study in peach <i>K. Gasic</i>	1
Growing English and French cider apple cultivars in Sweden <i>H. Nybom, T. Spoor, J. Sehic, A. Ekholm, K. Rumpunen and I. Tahir</i>	9
Propagation of some Turkish hazelnut cultivars by stooling <i>N. Beyhan, F. Aci and H.I. Balik</i>	15
'Gala Fult', red, crunchy, juicy, and early apple – an Uruguayan cultivar <i>D. Cabrera, P. Rodriguez, F. Rocca and R. Zoppolo</i>	23
'Marlena' – a new apple cultivar from Bulgaria <i>D. Sotirov and S. Dimitrova</i>	29
'Venice', a new Brazilian apple cultivar from Epagri <i>A.F. Brighenti, M.S. Pasa, M.N. Ciotta, J.M. Katsurayama, M.V. Kvitschal, M.C. Hawerroth and M. Couto</i>	33
A new early ripening apricot cultivar – 'Kuijin' <i>X.M. Xue, J.Z. Wang, A.N. Zhang and C. Lu</i>	41
Behaviour of some apple selections in Kyustendil, Bulgaria <i>S. Dimitrova, D. Sotirov and L. Song</i>	45
Breeding of new cultivars of the fruit crop Japanese quince ( <i>Chaenomeles japonica</i> ) in Latvia <i>E. Kaufmane and S. Ruisa</i>	51
Evaluation of fruit mineral contents of two apple cultivars grown in organic and integrated production systems <i>M. Fotirić Akšić, J. Mutić, Ž. Tešić and M. Meland</i>	59
Reaction of apple cultivars to abiotic and biotic stress factors <i>S. Dimitrova, D. Sotirov and M. Liu</i>	67
Phenotypical description of traditional apple cultivars from Sierra Norte de Madrid (autonomous community of Madrid, Spain) <i>A. Arnal, A. Lázaro and F.J. Tardío</i>	73
Comparison of fruit traits for Chinese cherry cultivars <i>C. Jia, P. Wu, Y. Sun, G.I.N. Waterhouse and D. Sun-Waterhouse</i>	81

Evaluation of physiochemical properties of different pomegranate cultivars in China <i>L. Feng, Y. Yin, X. Yang and H. Tang</i>	89
<b>Rootstock evaluation</b>	
Effects of apple rootstocks on nutrient concentration in 'Honeycrisp' scions in the early orchard life <i>J. Lordan, P. Francescatto, G. Fazio and T.L. Robinson</i>	97
Graft-compatibility of Rootpac rootstocks with nectarine and peach cultivars <i>M. Çetinbaş, S. Butar, H. Koçal, Y. Sesli and H.G. Seferoğlu</i>	105
Effects of dwarfing and semi-dwarfing apple rootstocks on the growth and yield of 'Gala', 'Fuji' and 'York' apples <i>S. Sherif, K.S. Yoder and G.M. Peck</i>	113
Effects of rootstock and crop load management on yield and fruit quality of early-season nectarine 'Rose Bright' and late-season peach 'September Sun' <i>M. O'Connell and D. Stefanelli</i>	121
Millennium planting density trial of 'Bramley's Seedling' apple on M.9 and M.27 rootstocks from 2000 to 2016 <i>S. Mac an tSaoir, G. Cross, S. Johnson, C. Humphries and J. Kearns</i>	131
Preliminary performance of six plum rootstocks on six European plum cultivars in Latvia <i>I. Grāvīte, E. Kaufmane, E. Cirša and J. Lanauskas</i>	137
Evaluation of apple rootstocks planted in different locations in South Africa <i>X.I. Siboga, W.P. Kotze, N.C. Cook and W.J. Steyn</i>	145
Scion architecture on dwarfing candidate pear rootstocks <i>A.P. Friend, R.N. Diack, B.M. van Hooijdonk, M. Knäbel, D.S. Tustin and J.W. Palmer</i>	153
Effect of rice straw mat and other mulching on apple root architecture and soil environment in root-zone <i>P. Huang, M. Xun, S. Yue, W. Zhang, W. Fan and H. Yang</i>	163
Effect of various rootstocks on macroelements of three grapevine ( <i>Vitis vinifera</i> L.) cultivars in the nursery <i>R. Ahmad, I. Al-Eissa and M. Batha</i>	171
Evaluation of different rootstocks with 'Van' sweet cherry cultivar <i>D. Sotirov</i>	179
Long-term evaluation of super-dwarf rootstock: impact on tree growth, productivity and apple fruit quality <i>N. Uselis, J. Lanauskas, J. Viškelis, M. Liaudanskas, G. Samuolienė and D. Kviklys</i>	185

## **Orchard architecture and training systems**

The first 50 days after anthesis – implications for apple yield, fruit quality and canopy management from a New Zealand perspective <i>B.M. van Hooijdonk, M.J. Oliver, R.N. Diack, D. Dayatilake, A.P. Friend, H. Boldingham, K.C. Breen, D.S. Tustin and J. Johnston</i>	191
Orchard architecture effects on yield and economics of two apple cultivars <i>R.M. Crassweller, L.F. Kime and D.E. Smith</i>	207
Light interception and yield of sweet cherry and apricot trees grown as a planar cordon orchard system design <i>C. Scofield, J. Stanley, M. Schurmann, R. Marshall, K.C. Breen, D.S. Tustin and M. Alavi</i>	213
Comparison of tall spindle axes and vogel central leader systems in cherry <i>I. Macit, E. Aydm, D. Soysal and H. Demirsoy</i>	223
Effect of crop load management and canopy architecture on yield and fruit quality of late-season plum 'Angeleno' <i>M. O'Connell and D. Stefanelli</i>	227
Branching 'Maxi Gala' apple tree grafted on several clonal rootstocks <i>L. Rufato, L.R. Marchioretto, J.C. Orlandi, L.O. Amaral, M.F. Michelon, A. Rossi, G.F. Sander and T.A. Macedo</i>	235

Modified pruning intensity may reduce labor costs and improve profitability of growing dessert apple cultivars for cider production <i>T.L. Bradshaw and J. Foster</i>	243
---	-----

## **Orchard management and physiology**

Air root pruning containers alter root architecture and increase canopy and root growth of apple trees compared to field grown liners <i>M. Elsyssy and T. Einhorn</i>	251
---	-----

Canopy management for optimizing productivity of polyculture coffee production system <i>I.A.M. Yunusa, T.I.D. Kukhang, K.S. Powell and B.P. Holzapfel</i>	257
---	-----

Fruitlet growth model to predict chemical thinning response on apples in southern Brazil <i>A.F. Brighenti, M.S. Pasa, E. Brighenti, M.N. Ciotta and Z.S. Souza</i>	265
--	-----

Plant growth regulators do not reduce biennial bearing of two cider apple cultivars in Vermont, USA <i>T.L. Bradshaw, J. Foster and S.L. Kingsley-Richards</i>	273
---	-----

Alternatives to use of hydrogen cyanamide in bud breaking in apple 'Maxi Gala' <i>S.C. Uber, A.A. Kretzchmar, D. Correa, R.V. Botelho, F.N. Silveira, E. Fagundes and L. Rufato</i>	279
--	-----

Identifying successful pollinizers of plum cultivars 'Edda' and 'Opal' in Ullensvang, Norway, using microsatellites <i>M. Meland, O. Frøynes, F. Gasi, B. Kalamujić-Stroil and L. Lasic</i>	285
--	-----

Scoring effects on tree vigor and fruit quality of 'Fuyu' persimmon trees <i>S.T. Choi, G.H. Ahn, S.C. Kim and K.P. Hong</i>	289
Sensitivity of apple ( <i>Malus domestica</i> Borkh.) fruit peel to high irradiance and temperature as influenced by a range of rootstocks in South Africa <i>P.D. Barasu, W.J. Steyn, M. Schmeisser and S.J.E. Midgley</i>	297
<b>Sustainable orchard systems</b>	
Apple farming systems – current initiatives and some prospective views on how to improve sustainability <i>P.É. Lauri, B. Pitchers, L. Dufour and S. Simon</i>	307
Growing agroforestry systems with apple in Montpellier-Mediterranean – preliminary results on the influence of adult walnut trees on growth and branching of two-year-old apple trees <i>B. Pitchers, L. Dufour and P.É. Lauri</i>	323
How soil microbial biodiversity is modified by soil chemical parameters in differently managed olive orchards <i>A.N. Mininni, C. Fausto, A. Sofo, P. Ricciuti, V. Nuzzo and C. Xiloyannis</i>	331
Nutritional status of stone fruit trees on dwarfing and vigorous rootstocks under warm Mediterranean conditions <i>J. Ben Yahmed, M. Ghrab, H. Benmoussa and M. Ben Mimoun</i>	339
White root tip dynamics of bearing apple trees in a Mediterranean climate, South Africa <i>E. Lötze, F.J. van Zyl and N.J. Taylor</i>	347
Is cutting method a reliable tool for estimating pistachio climatic requirements in warm Mediterranean conditions? <i>H. Benmoussa, M. Ghrab, J. Ben Yahmed and M. Ben Mimoun</i>	355
Responses of 'Fuyu' persimmon trees to different supplemental nitrogen application times <i>S.T. Choi, G.H. Ahn, S.C. Kim and J.H. Kwon</i>	363
Effects of water stress on leaf antioxidant enzymes activities and protein contents in five <i>Prunus</i> rootstocks <i>F. Akyüz, A.N. Yıldırım, F. Yıldırım, B. Şan, Y. Karakurt, C. Çelik and S. Önder</i>	369
<b>Innovative management practices</b>	
Microclimatic physiological and productive effect of the overcanopy irrigation in an apple orchard <i>L. Manfrini, G. Gatti, B. Morandi, L. Corelli Grappadelli, G. Bortolotti, F. Rossi, O. Facini, C. Chieco, M. Gerin, D. Solimando, T. Letterio and S. Anconelli</i>	377
Differential thermal analysis sheds light on the effect of environment and cultivar in peach floral bud cold hardiness <i>I.S. Minas and D. Sterle</i>	385
Promoting fruit set of 'Ingeborg' pears in a northern climate <i>M. Meland, O. Frøynes, M. Fotirić Akšić and F.M. Maas</i>	393

Precision crop load management in apples <i>P. Francescatto, J. Lordan and T.L. Robinson</i>	399
Near infrared spectroscopy can non-destructively assess the effect of canopy position and crop load on peach fruit maturity and quality <i>I.S. Minas, F. Blanco Cipollone and D. Sterle</i>	407
Efficacy of metamitron as a postbloom thinner – the American Northeast experience <i>P. Francescatto, J. Lordan and T.L. Robinson</i>	413
<b>Climate change</b>	
Are the chilling temperatures the only climatic factor to overcome endo-dormancy in the temperate fruit trees? Which other climatic factors can affect the endo-dormancy and the effect of the chilling temperatures? <i>G. Finetto</i>	421
Climate change affects fruit crops <i>A.B. Kuden</i>	437
The challenge of warming winters – do we understand tree dormancy enough to prepare deciduous orchards in warm places? <i>E. Luedeling</i>	441
Strategies for producing temperate tree fruit under increasing winter temperatures <i>G.L. Reighard</i>	449
<b>INTERNATIONAL SYMPOSIUM ON UNDERSTANDING FRUIT TREE BEHAVIOUR IN DYNAMIC ENVIRONMENTS</b>	
<b>Ecophysiology</b>	
Fruit growth, photosynthesis and starch accumulation are differentially affected by local variation in source/sink ratios <i>F. Belhassine, S. Martinez, S. Bluy, D. Fumey, J.J. Kelner, E. Costes and B. Pallas</i>	455
Stomatal regulation of transpiration and photosynthesis in macadamias <i>N.J. Taylor, T.G. Smit, S.J.E. Midgley and J.G. Annandale</i>	463
Estimating fruit orchard stomatal conductance and transpiration under dynamic environments <i>E. Kullaj, L. Lepaja and J. Kučera</i>	471
<b>Tree and orchard management</b>	
Water productivity of high performing apple orchards in the winter rainfall area of South Africa <i>S.J.E. Midgley, S. Dzikiti, T. Volschenk, F.S. Zirebwa, N.J. Taylor, M.B. Gush, E. Lötze, Z. Ntshidi and N. Mobe</i>	479

Physiological responses to rootstocks vigor in cherry: why dwarfing is efficient? <i>B. Morandi, L. Manfrini, S. Lugli, A. Tognoli, A. Micheli, A. Boini, G. Perulli, K. Bresilla and L. Corelli Grappadelli</i>	487
Benefits of intensive production systems in mango <i>I.S.E. Bally, P. Ibello, M. Kare, C. Wright, A. Mizani and J. Wilkie</i>	493
Illuminating the relationship between canopy light relations and fruit yield in apple planar cordon orchard systems <i>K.C. Breen, J.M. Wilson, M.J. Oliver, B.M. van Hooijdonk, D.S. Tustin and G.A. Dayatilake</i>	499
Fruit set and quality responses to artificial spur extinction in planar cordon sweet cherry trees <i>J. Stanley, C. Scofield, M. Schurmann, R. Marshall, M. Wohlers and D.S. Tustin</i>	507
Research to prevent double fruit formation depending on climate change on cherries <i>A.B. Kuden, B. Imrak, A. Kuden, A. Sarier and S. Comlekcioglu</i>	517
Investigating the effects of planting density and tree size on yield through functional-structural modeling <i>I. Auzmendi and J. Hanan</i>	523
Mechanical thinning of apples reduces fruit drop <i>M. Penzel, M. Pfanzl, R. Gebbers and M. Zude-Sasse</i>	533
<b>Environmental effects: drought</b>	
Assessing the effects of water stress on peach fruit quality and size using the QualiTree model <i>M. Rahmati, J.M. Mirás-Avalos, P. Valsesia, G.H. Davarynejad, M. Bannayan, M. Azizi, F. Lescourret, M. Génard and G. Vercambre</i>	539
Summer drought impacts annual shoot growth dynamics in apple tree: a comparative study on three cultivars <i>B. Pallas, D. Chen, S. Martinez, Y. Wang and E. Costes</i>	547
Water use of an intermediate and a mature avocado orchard <i>E. Mazhawu, A.D. Clulow, N.J. Taylor and M.J. Savage</i>	555
Assessing the robustness of leaf fluorescence parameters for phenotyping the genotypic variability in photosynthesis across hundreds of apple tree cultivars <i>A. Coupel-Ledru, J.L. Regnard, B. Pallas, S. Martinez, M. Delalande, B. Morandi, L. Manfrini, S. Tartarini, L. Corelli Grappadelli and E. Costes</i>	563
An approach for estimation of maximum pistachio rooting depth in saline condition <i>M.H. Rahimian, M. Shayannejad, R. Yazdani Biouki and Y. Hasheminejad</i>	571
<b>Environmental effects: temperature</b>	
Variance components of fruit quality – a ‘Golden Delicious’ case study in South Africa <i>E.D. Louw, A.F.W. van Lingen and W.J. Steyn</i>	577

Identification of QTLs for chilling and heat requirements for bud dormancy release in <i>Prunus mume</i> and their co-localization with the <i>DAM6</i> eQTL <i>H. Yamane, W. Chen, Y. Kitamura, T. Habu and R. Tao</i>	585
Relative stability of peach plants to acid stress <i>Y. Plugatar, O. Klimenko and N. Klimenko</i>	593
<b>Modelling within-tree processes</b>	
Assessing the role of ageing and light availability in leaf mortality in the mango tree <i>F. Boudon, S. Persello, I. Grechi, A. Marquier, C. Soria, C. Fournier, M. Léchaudel and F. Normand</i>	601
Architectural factors affect fruit set in mango: evidence and modelling <i>S. Persello, I. Grechi, F. Boudon and F. Normand</i>	609
Fruit water content: a benefit in the fruit carbohydrate accumulation simulation <i>J.L. Chen, G. Vercambre, N. Bertin, H. Gautier and M. Génard</i>	617
Assessing T-LiDAR technology for high throughput phenotyping apple tree topological and architectural traits <i>B. Pallas, S. Martinez, O. Simler, E. Carrié, E. Costes and F. Boudon</i>	625
The mango tree - blossom gall midge system: toward in silico assessment of management practices <i>I. Grechi, L. Saint Criq, A. Ratnadass, F. Normand, C. Soria, L. Brustel, P. Amouroux and F. Boudon</i>	633
Internal fruit quality depends on the regulation of apple-tree vegetative growth <i>J. Viškelis, M. Liaudanskas, N. Uselis and D. Kviklys</i>	643
Transcriptome profiling of cold hardiness related genes in peach tree ( <i>Prunus persica</i> ) shoots <i>J. Park, D.J. Yu, S. Chea, J.H. Kwon and H.J. Lee</i>	649