

LIST OF CONTENTS

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

II INTERNATIONAL SYMPOSIUM ON SOILLESS CULTURE

Substrates and substrate culture

Integrated rootzone management for successful soilless culture <i>Youbin Zheng</i>	1
Coconut fiber: evaluation of physicochemical properties and enzymatic activity in soilless culture during three cycles of organic cultivation <i>P.A. Mejía, M.C. Salas and M.J. López</i>	9
Particle density of substrate components measured by gas pycnometer <i>P.C. Bartley III, A. Amoozegar, W.C. Fonteno and B.E. Jackson</i>	17
Evaluating the efficiency of two automatic fertigation systems in soilless crops: substrate moisture sensors vs. timer systems <i>M.C. Salas, P.A. Mejía, N. Domínguez and J.L. Ruiz</i>	23
Off-seasonal soilless production of green vegetables in reused substrates in Mediterranean unheated greenhouses <i>G.B. Oztekin and A. Gul</i>	31
Monthly variations in fruit quality of hydroponic tomatoes grown in high technology greenhouses <i>M. Bonakdarzadeh, F. Sen and A. Gul</i>	37
The effects of glycine betaine on pomology, yield and biochemical characteristics of strawberry plants under soilless culture <i>N. Adak and I. Tozlu</i>	45
Volcanic tuff substrate improves growth and flower quality of Asiatic lily <i>M.G. Al-Ajlouni and Y.A. Othman</i>	53

Water culture

Effect of hydroponic crop set system powered by various types of energy on the growth of green oak lettuce <i>T. Sumet</i>	59
Impact of nutrient solution concentration and growth period on baby leaf purslane production in floating system <i>G.B. Oztekin, T. Uludag and Y. Tuzel</i>	65
Effects of salinity on iceberg lettuce production in floating hydroponics <i>A. Gul, G.B. Oztekin, Y. Tuzel, İ.H. Tuzel and M. Tepecik</i>	75
Effect of different salinity levels on rocket production in a floating system <i>H. Duyar and C.C. Kılıç</i>	85

Root-zone CO ₂ enrichment increases biomass accumulation in lettuce and pepper grown hydroponically and aeroponically <i>E. Leibar-Porcel, M.R. McAinsh and I.C. Dodd</i>	93
Optimization of root spraying time for fresh onion (<i>Allium cepa</i> L.) cultivation in aeroponics <i>B. İköz, H.Y. Dasgan and S. Dere</i>	101
Comparison of substrate, hydroponic and aeroponic cultivation systems for the production of carrot root <i>S.N. Yıldız, H.Y. Dasgan and S. Dere</i>	107
Aquaponics using Asian leafy vegetables – potential and challenge <i>M.H. Böhme, M. Dewenter and A. Gohlke</i>	115
Study of a bacterial community in the aquaponic closed-loop system of Gembloux Agro Bio-Tech <i>M. Eck, S. Massart and M.H. Jijakli</i>	123
Strategies for protecting environment in soilless systems	
Zero liquid discharge in soilless greenhouse horticulture: solutions to save water and the environment while ensuring an optimal production <i>E.A. van Os, E.A.M. Beerling, C. Blok, R. Leyh, J.P.M. van Ruijven, M. van der Staaij, J. Janse, R. Kaarsemaker and W. Roosen</i>	129
Strategy to minimise nitrogen load to finish a zero discharge cultivation <i>R. Leyh, E.A. van Os, C. Blok, J.P.M. van Ruijven and R. Kaarsemaker</i>	137
Implementation of purification equipment for removal of plant protection products from horticultural discharge water <i>J.P.M. van Ruijven, E.A. van Os, M. van der Staaij, B. Eveleens-Clark and E.A.M. Beerling</i>	145
Beneficial microorganisms	
Impact of grafting and different strains of plant growth promoting rhizobacteria on tomato plants grown hydroponically under combined drought and nutrient stress <i>P. Kalozoumis, G. Ntatsi, G. Marakis, E. Simou, A. Tampakaki and D. Savvas</i>	153
Use of microalgae (<i>Chlorella vulgaris</i>) to save mineral nutrients in soilless grown tomato <i>G. Aydoner Coban, H.Y. Dasgan, Y. Akhoundnejad and B. Ak Cimen</i>	161
Effects of microalgae <i>Chlorella vulgaris</i> on hydroponically grown lettuce <i>O. Ergun, H.Y. Dasgan and O. Isik</i>	169
Effects of mycorrhiza and irrigation programs on strawberry production in substrate culture <i>N. Unal, Y. Tuzel, İ.H. Tuzel and G.B. Oztekin</i>	177

Salt stress

The effects of rootstock to improve melon growth and physiological responses in salt stress 183
S. Avcu, H.Y. Dasgan, Y. Akhoundnejad and O. Ergun

Soilless cultivation of strawberry (*Fragaria* sp. 'Holibrite') with salt stress treatments in a tropical environment for improving fruit quality 191
M.A.F. Falah, D.R.S. Brigita, P. Okky, E.K. Novita and K. Nafis

Nutrition

The effect of chelating Zn, Cu and Mn on plant Fe nutritional status of hydroponically grown tomato plants 199
L.M. Bin, R. Moerkens, A. Noordam, R. van Aert and M.H.J. Bugter

Effects of boron foliar sprays on tomato cultivation 207
W.P. Sturião, J.J. Lucena, H.E.P. Martinez and S. López-Rayó

Sulfur fertilization enhances ajoene accumulation in hydroponically grown garlic 217
M.T. Naznin, Y. Kitaya, H. Hirai and B.W. Alsanian

Effect of calcium on pistachio (*Pistacia vera* L. 'Siirt') seedling growth 223
N. Aslan, K. Sarpkaya, N. Kalkanci, T. Simsek and A. Yilmaz

Nutrient disorders

Comparing nutrient disorder symptomology of *Lactuca sativa* 'Salanova Green' and 'Salanova Red' 227
J.B. Henry, P. Cockson, I. McCall and B.E. Whipker

Characterization of nutrient disorders of *Dieffenbachia maculate* 235
P. Cockson, D. Cockson, I. McCall and B.E. Whipker

Dahlia foliar nutrient sufficiency ranges and growth response to fertilizer concentrations 243
J.B. Henry, I. McCall, P. Cockson and B.E. Whipker

Lighting

Plant factories with artificial lighting (PFALs) toward sustainable plant production 251
T. Kozai, E. Hayashi and Y. Amagai

Green light penetrates inside crisp head lettuce leading to chlorophyll and ascorbic acid content enhancement 261
S. Saengtharapip, N. Goto, T. Kozai and W. Yamori

Light quality and photoperiod influence crop growth, productivity and produce quality in hydroponic vegetable production 271
B.M. Thomas and D.G. Awadh

Hydroponic forcing of saffron (*Crocus sativus* L.) 281
F.-G. Schroeder, D.R. Lozoya and P. Ruser

VIII INTERNATIONAL SYMPOSIUM ON SEED, TRANSPLANT AND STAND ESTABLISHMENT OF HORTICULTURAL CROPS (SEST 2018)

Seed quality and health

- Seed quality is crucial to successful seedling production in horticulture
A.A. Powell 289
- Seed health and quality of selected vegetable cultivars from different seed producers
M.M. Slabbert and R. Kleynhans 299
- Good seed and plant practices – an example of a process approach to preventing *Cmm* from entering the tomato propagation chain
C. Peusens and E. Lesprit 307
- Seed germination and emergence of two *Cyrtanthus* species
N.N. Sibande, R. Kleynhans and B. Matsiliza-Mlathi 315
- Do seed harvest period and drying method affect the seed quality and yield in onion?
G. Baslar and H. Ilbi 323

Transplant quality and stand establishment

- An approach to determine pepper seedling quality grown in cylindrical paper pots
T.C. Seo, S.W. An, C.W. Nam and H. Chun 329
- Control of transplant height in tomato using plant growth regulator prohexadione calcium
N. Ozbay and D.A. Hassan 337
- Emergence, transplant vigor, stand establishment and juvenile growth of soursop (*Annona muricata* L.) seedlings as affected by seed weight and nursery media
N.A. Okoli, J.C. Obiefuna, I.I. Ibeawuchi, R.A. Alagba and L.C. Emma-Okafor 347
- Effect of nitrogen and pot volume on pepper (*Capsicum annum* L.) and eggplant (*Solanum melongena* L.) seedlings development
G. Dumičić, M. Cukrov, G. Lemić, K. Žanić and B. Urlić 355
- Onion set cultivation as a system for overcoming yield reduction by the unstable climate during the establishment period
H. Araki and L. Huang 361
- Effects of plant growth-promoting rhizobacteria and olive waste compost on organic tomato seedling production
Y. Tuzel, G.B. Oztekin, K. Ekinci, N. Varol, H. Ozaktan and G. Besirli 369
- Tray seedling density and transplanting date impacted onion yield and bulb size
M.A. Macías-León and D.I. Leskovar 377

Effects of plant growth-promoting rhizobacteria combined with composts obtained from rose oil processing wastes on organic tomato seedling production <i>G.B. Oztekin, Y. Tuzel, K. Ekinici, H. Ozaktan and G. Besirli</i>	387
Pretransplant-N concentration of the nutrient solution influences growth and yield of hydroponic lettuce <i>D. Djidonou and D.I. Leskovar</i>	395
Seed technology	
Microbial seed coating as a tool to enhance crop growth and stress tolerance <i>M. Vosátka, I. Rocha, Y. Ma, E.B. Švecová and R. Oliveira</i>	401
Ameliorative effects of some priming treatments on germination and emergence of lettuce seeds under high temperature conditions <i>N. Ozbay and M.J. Muhamed</i>	409
Impact of seed pelleting on germination potential, seedling growth and storage of tomato seed <i>T. Javed and I. Afzal</i>	417
Changes in melatonin content of pepper seeds during storage <i>G. Yakupoğlu, Ş. Köklü, A. Karaca, E. Düver, A. Klicic and A. Korkmaz</i>	425
Improvement of seed germination of caper (<i>Capparis spinosa</i> L.) through magnetic fields <i>M. Juan, N. Pascual-Seva, D. Iranzo and B. Pascual</i>	433
Seed treatment with tryptophan improves germination and emergence of pepper under salinity stress <i>A. Korkmaz, A. Gerekli, G. Yakupoğlu, A. Karaca and Ş. Köklü</i>	441
Grafting	
Rootstocks for increasing yield stability and sustainability in vegetable crops <i>C. Martínez-Andújar, A. Albacete and F. Pérez-Alfocea</i>	449
Effects of rootstocks with vigorous root system on growth and development of pepper (<i>Capsicum annuum</i> L.) inbred lines <i>F. Ulas, H. Yetisir and A. Ulas</i>	471
Growth of pepper inbred lines as affected by rootstocks with vigorous root system under salt stress conditions <i>O.M. Al Rubaye, H. Yetisir, F. Ulas and A. Ulas</i>	479