Volume 69, No. 1 March, 2012

Print: ISSN 0972-8538 Online: ISSN 0974-0112

Indian Journal of

Horticulture



The Horticultural Society of India Indian Agricultural Research Institute
New Delhi-110 012

Website: www.hsi1942.in



Overseas distribution IOS Press, The Netherlands

CONTENTS						
Agrobacterium-mediated transfer of chitinase gene in apple (Malus x domestica Borkh.) rootstock MM106 - R. Sharma, M. Modgil, P. Sharma and U. Saini	_ 1	Comparison of nutritional quality of organically versus conventionally grown tomato – K. Sreedevi Shankar, S. Sumathi, M. Shankar and N.N. Reddy Effect of plant growth regulators on growth and	86			
Studies on fruit set in coconut upon artificial pollination in various cross combinations — Regi J. Thomas, R.V. Nair, C. Mathews, R. Ajithkumar,		yield of coriander - Dheer Singh, P.P. Singh, I.S. Naruka, S.S. Rathore and R.P.S. Shaktawat	91			
M. Sasikala and C.K. Nampoothiri Comparative performance of different grafting techniques in grape cv. Pusa Urvashi – S.K.	7	Growth, yield and quality of fenugreek (<i>Trigonella foenum-graecum</i> L.) as influenced by nitrogen, phosphorus and bio-fertilizers – R.S. Mehta, M.M. Anwer, O.P. Aishwath and R.S. Meena	94			
Verma, S.K. Singh, Hare Krishna and V.B. Patel Budding performance of Nagpur mandarin on different rootstocks under Hadoti region of Painethen literature Singh Arms Vedex B.	13	Performance of gerbera varieties for flowering, yield and quality parameters under shade net – Shruti Wankhede and R.P. Gajbhiye	98			
Rajasthan – Jitendra Singh, Aruna Yadav, P. Bhatnagar, C.K. Arya, M.C. Jain, M.K. Sharma and K. Aravindakshan	20	Comparative evaluation of pesticides and biorationals against key pests of greenhouse chrysanthemum – Naved Sabir, Sikha Deka,				
Studies on visualizing frost/freeze damage in subtropical fruit species – Shashi K. Sharma	27	R.K. Tanwar, Balraj Singh, Sumitha Raj, Susmita Adhikari and S.S. Sindhu	101			
Levels and time of potassium fertilization influence soil and leaf nutrient composition and its relation with yield of litchi – P.K. Pathak, K. Majumder and S.K. Mitra	33	Effect of ripening stages on physico-chemical characteristics of fresh and osmo-dehydrated mango slices – P. Suresh Kumar, V.R. Sagar and S.K. Singh	106			
Fruit set and quality improvement studies on semi- soft pear cv. Punjab Beauty – Jagroop Gill, W.S. Dhillon, P.P.S. Gill and Navprem Singh	39	Relationship of trunk cross-sectional area with growth, yield, quality and leaf nutrient status in Kinnow mandarin – R.P.S. Dalal and J.S. Brar	111			
Effect of bio-organic and inorganic nutrient sources to improve leaf nutrient stalees apricot – V.J. Singh, Som Dev Sharma, Pramod Kumar and Satish Kumar Bhardwaj	45	Short communications Evaluation of papaya varieties under North Gujarat				
Influence of organic and inorganic nutrient sources on soil properties and quality of <i>aonla</i> in hot semi-arid ecosystem – A.K. Singh, Sanjay Singh and V.V. Appa Rao	50	conditions – B.S. Meena, L.R. Varma and R.S. Mehta Effect of different pruning intensities on the growth, flowering, yield and quality of nectarine – Nidhika Thakur and Vishal S Rana	114 117			
Effect of post flowering foliar sprays of nutrients for accelerating harvesting of <i>kokum</i> (<i>Garcinia indica</i> Choisy) – P.M. Haldankar, A.V. Somavanshi, A.D. Rangwala, R.G. Khandekar and M.M. Burondkar	55	Comparison of fluorescein- and ³² P-labelled probes for safe detection of potato spindle tuber viroid in potato – Priyanka Kaundal, Jagesh K. Tiwari, Nimisha Kaushal, Deep Kumar, J. Gopal, S.K.				
Effect of induced chlorophyll mutation, mutagenic efficiency and effectiveness of gamma rays and EMS in paprika (<i>Capsicum annuum</i> L.) cv. Bydagi		Pandey and I.D. Garg Selection of garlic genotypes for yield, quality and	121			
Kaddi – G. Ashokkumar, V. Ponnuswami and S.T. Bini Sundar	60	better storage – B.K. Dubey and R.K. Singh Effect of in-situ conservation practices on soil	128			
Generation mean analysis of yield related traits and inheritance of fruit colour and surface in bitter gourd – Dalamu, T.K. Behera, C. Tara Satyavati and Anand Pal	65	properties and yield of broccoli under rainfed conditions of mid hill zone of Himachal Pradesh – R.S. Spehia, B.C. Thakur and J.N. Raina	132			
Association studies in single and double cross F ₂ populations of okra – Ajjappa Sogalad, G.	00	Intercropping medicinal plants in black pepper – C.K. Thankamani, K. Kandiannan and S. Hamza	136			
Shanthakumar, Prakash Gangashetty and P.M. Salimath	70	Effect of <i>in vivo</i> and <i>in vitro</i> seed germination and performance of <i>Lisianthus</i> seedlings – Arpana Mahajan, M.K. Singh, Raja Ram, S. Kumar, R.				
Studies on genetic variability and character association in temperate carrot – A.J. Gupta, T.S. Verma, R. Bhat and S. Mufti	75	Prasad and P.S. Ahuja Underutilized citron (<i>Citrus medica</i> L.) fruit for development of value-added products and their	139			
Stability analysis of yield and its component traits in fenugreek germplasm – K.K. Gangopadhyay, S.K.		ambient storage – Lallan Ram and Dinesh Kumar Hort Horizons	143 i			
Tehlan, R.P. Saxena, A.K. Mishra, H.L. Raiger,		Llert News	:::			

Published by Dr K.L. Chadha and edited by Dr S.K. Singh for the Horticultural Society of India, F1, National Society's Block, National Agricultural Science Centre Complex, Todapur, Pusa Campus, New Delhi - 110 012, India and printed at Malhotra Publishing House, B-6, DSIDC Packaging Complex, Kirti Nagar, New Delhi 110 015, India.

79

S.K. Yadav, Gunjeet Kumar, M. Arivalagan and

M. Dutta

Hort News

Annoucements

iii

iν

Volume 69, No. 2 June, 2012

Print: ISSN 0972-8538 Online: ISSN 0974-0112

Indian Journal of

Horticulture



The Horticultural Society of India Indian Agricultural Research Institute

New Delhi-110 012

Estd. 1942 Website: www.hsi1942.in



Overseas distribution
IOS Press, The Netherlands

CONTENTS

Molecular cloning and characterization of a partial mitogen-activated protein kinase cDNA, <i>CnMAPK1</i> induced in response to water stress in coconut – Bobby Paul, Rajesh M.K. and Naresh Kumar S.	145	Character association and path coefficient analysis in rose (<i>Rosa</i> × <i>hybrida</i>) – Sapna Panwar, Kanwar P. Singh, K.V. Prasad, C. Tara Satyavathi and Namita	231
Effect of integrated nutrient management in mango cv. Sunderja – U.S. Gautam, Rajesh Singh, Neelam Tiwari, P.S. Gurjar and Ashish Kumar	151	Exploring genetic relationships in <i>Artemisia</i> species growing in trans-Himalayan cold arid desert using RAPD markers – Jitendra Kumar, Gyan P. Mishra,	
A study on diversity and distribution of kokum (Garcinia indica (Choisy) Thouars) using DIVA-GIS in Goa with respect to fruit characters – Priya Devi.	,	A.A. Murkute, G. Phanikumar, Pradeep K. Naik and R.B. Srivastava Effect of spacing and biofertilizers on growth and	239
S., T.N. Balamohan, M. Thangam, J. Ashok Kumar, K. Ramachandrudu and V.S. Korikanthimath	156	nutrients of stevia (<i>Stevia rebaudiana</i> Bertoni) – V.P. Singh, Jai Prakash, R.K. Singh and	040
Non-destructive leaf area estimation in pomegranate cv. Bhagwa – D.T. Meshram, S.D. Gorantiwar, N.V. Singh and S.S. Suroshe	163	A. Nataraj Pre-harvest treatments for shelf-life extension of Khasi mandarin under different storage conditions	246
Integrated nutrient management improves growth and leaf nutrient status of guava cv. Pant Prabhat –	168	 Bidyut C. Deka, Shahida Choudhury and A. Bhattacharyya 	252
Amit Kumar Goswami, Shant Lal and K.K. Misra Response of yield and quality of winter guava to severity of summer pruning – Satya Prakash, Virendra Kumar, P.L. Saroj and S.C. Sirohi	173	Effect of 1-MCP on shelf-life and quality of kiwifruit stored under ambient conditions – Md. Jameel Jhalegar, R.R. Sharma, R.K. Pal and Swati Sharma	258
Effect of integrated organic nutrient sources on soil nutrient status and microbial population in strawberry field – Nowsheen Nazir, S.R. Singh,		Effect of 1-methylcyclopropene on storage life and quality of peaches – B.V.C. Mahajan and S.R. Sharma	263
M.K. Sharma, F.A. Banday, V.K. Sharma, Aroosa Khalil and Shazia Hayat	177	Reaction of <i>Vitis</i> genotypes at the National Active Germplasm Site to downy mildew infection under	
Growth, yield and quality of guava as influenced by varying rejuvenation periods – N.K. Singh, D.C. Shrivastava and A.P. Bhandarkar	181	tropical humid conditions of India – Indu S. Sawant, G.S. Karibasappa, Kiran P. Deokar, Dinesh Shetty and Anuradha Upadhyay	268
Evaluation of improved lines of tomato for yield performance and disease resistance under open field conditions – S.K. Sain and M.L. Chadha	185	Short communications Quality parameters studies on <i>Mangifera</i> genus and	
Combining ability analysis of yield and its component in okra – B. Singh, M. Kumar and R.K. Naresh	195	varieties – Man Bihari, R. Kumar, K. Singh, A. Kumar, A. Prasad, Surya Narayan and S.K.N. Pandey	272
Heterosis and inbreeding depression for fruit characters in cucumber – Raghvendra Singh, Anand K. Singh, Sanjay Kumar and B.K. Singh	200	Effect of irrigation systems and frequencies on growth and yield of papaya - P.K. Jain and Akhilesh Tiwari	277
Root morphology of tomato and brinjal as influenced by Cr toxicity – Mamta Gautam, Anil	200	Response of lemon cv. Baramasi to foliar feeding of nutrients – Savreet Sandhu and J.S. Bal	281
Kumar Singh and Rajiv Mohan Johri Role of oxalic acid on shelf-life and physicochemical	205	Shelf-life evaluation of <i>ber</i> (<i>Ziziphus mauritiana</i> Lamk.) cultivars – Pranava Pandey and J.N. Singh	284
characteristics of tomato – Kamal Kant, Ajay Arora, V.P. Singh and Raj Kumar	209	Impact of inorganic to organic cultivation practices on yield of tea in Darjeeling hills - A case study -	
Studies on influence of bio-fertilizers on quality and economics of cauliflower cv. PSB K-1 production - Manisha Kachari and B.N. Korla	215	J.S. Bisen and A.K. Singh Response of capsicum to different plant density	288
Molecular characterization of selected somaclones n ginger using RAPD markers – Resmi Paul, M.R.		under polyhouse and open conditions – S. Brahma, D.B. Phookan, M. Kachari and T.K. Hazarika Effect of foliar spray of boron on biology, egg laying	292
Shylaja and P.A. Nazeem Genetic variability studies on Mussaenda species variation among five Mussaenda species	221	activity and control of brinjal shoot and fruit borer (<i>Leucinodes orbonalis</i> Guen.) – S. Satpathy, Akhilesh Kumar, T.M. Shivalingaswamy and A.B. Rai	295
detected by random amplified polymorphic DNA – A.K. Mukherjee, L.K. Acharya, T. Mohapatra and		Hort News	i
P. Das	226	Hort Horizons	iv

Published by Dr K.L. Chadha and edited by Dr S.K. Singh for the Horticultural Society of India, F1, National Society's Block, National Agricultural Science Centre Complex, Todapur, Pusa Campus, New Delhi - 110 012, India and printed at Malhotra Publishing House, B-6, DSIDC Packaging Complex, Kirti Nagar, New Delhi 110 015, India.

Volume 69, No. 3 September, 2012 Print: ISSN 0972-8538 Online: ISSN 0974-0112

Indian Journal of

Horticulture



Estd. 1942

The Horticultural Society of India

Indian Agricultural Research Institute
New Delhi-110 012

Website: www.hsi1942.in



Overseas distribution
IOS Press, The Netherlands

CONTENTS

SSR markers reveal genetic diversity in closely related mango hybrids – Anshuman Singh, A.K. Singh and S.K. Singh	299	Standardization of foliar nutrients (NPK) spray in anthurium cv. Flame – R.A. Gurjar, B.K. Dhaduk, S.L. Chawla and Alka Singh	390
Molecular characterization of <i>Syzygium cuminii</i> (wild <i>jamun</i>) from A&N Islands – Israr Ahmad, S. Bhagat, P. Simachalam and R.C. Srivastava	306	Effect of media and nutrition on growth and flowering of <i>Cymbidium</i> hybrid 'H.C. Aurora' – D. Barman, T.U. Bharathi and R.P. Medhi	395
Morphogenetic analysis of pineapple cultivars of Tripura – Jai Prakash, K. Chattopadhyay and N.P. Singh	312	Requirement of major nutrients for annatto (<i>Bixa orellana</i> L.) seed yield and bixin content – Sudhir Kumar, R. Venugopalan, V.K. Rao, A.K. Nair and R. Chithiraichelvan	399
Leaf nutrient composition, its correlation with yield and quality of sweet orange and soil microbial population as influenced by INM in Vertisol of central India R.A. Marathe, P.R. Bharambe,		Effect of heat shrinkable films on storability of kiwifruits under ambient conditions – R.R. Sharma, R.K. Pal and Vishal Rana	404
Rajvir Sharma and U.C. Sharma Effect of N and K application on yield and quality of pomegranate cv. Ganesh under rainfed conditions – Poonam Kashyap, K.K. Pramanick,	317	Comparison of cell wall degrading enzyme activities during ripening of guava fruit on-tree and in-storage – Arti Sharma, R.K. Sharma, Saleem Siddiqui and Bindiya Sharma	409
K.K. Meena and Vijay Meena	322	Short communications	
Studies on high density planting in almond in Kashmir valley – Dinesh Kumar, Nazeer Ahmed and M.K. Verma	328	Reproductive phenology, flower biology and pollination in jamun (Syzygium cuminii L.) - Anju	
Integrated nutrient management in pomegranate grown in laterite soil – S.N. Ghosh, B. Bera, S. Roy and A. Kundu	333	Bajpai, A.K. Singh and H. Ravishankar Effects of GA ₃ and IBA on germination of pistachio – Halil Ibrahim Oguz and Gökhan Akkuş	416 420
Somatic embryogenesis and plantlet regeneration from embryogenic suspension culture in muskmelon – S.K. Bairwa, M.K. Tripathi, S.S. Kushwah, B.S.		Performance of wedge grafting in guava under different growing conditions – M.M. Syamal, Ranjeet Katiyar and Mamta Joshi	424
Baghel and S. Tiwari	338	Response of pre-harvest foliar application of zinc	
Studies on heterosis and combining ability for earliness and yield in sponge gourd – Sabina Islam, A.D. Munshi and Ravinder Kumar	348	and boron on mango cv. Amrapali under New Alluvial Zone of West Bengal – N. Bhowmick, B.C. Banik, M.A. Hasan and B. Ghosh	428
Seed development and acquisition of desiccation tolerance during maturation of okra seed – Jagadish Hosamani, V.K. Pandita and B.S. Tomar	353	Genetic divergence analysis of pear using qualitative traits as per DUS guidelines – K.K. Srivastava, S.R. Singh, N. Ahmad, B. Das, O.C. Sharma, J.A. Rather and S.K. Bhat	432
Influence of irrigation interval, nitrogen level and crop geometry on production of trickle irrigated lettuce – Tejaswini Patil, Man Singh, Balraj Singh, Manoj Khanna, D.K. Singh and S.S. Parihar	360	Static magnetic field exposure improves germination and vigour of fresh and carry over seeds of garden pea – Shantha Nagarajan, Jyotsna Bharadwaj, Anjali Anand, V.K. Pandita	
Genetic variability, heritability, genetic advance, correlation coefficient and path analysis in		and A.P.S. Verma Organic mulches affecting yield, quality and	435
gladiolus - Rahul Kumar, Sanjay Kumar and Yogesh Chandra Yadav	369	diseases of ginger in mid hills of North Eastern Himalayas – Ashok Kumar, R.K. Avasthe, Tasvina	
Evaluation of rose varieties for pollen efficiency – Prativa Lakhotia, D.V.S. Raju, K.V. Prasad and R. Chaudhury	374	R. Borah, Boniface Lepcha and Brijesh Pandey Heterosis and inbreeding depression in tomato under low temperature regime – Pramode Kumari	439
Effect of elevated carbon-dioxide levels on		Negi, R.R. Sharma and Raj Kumar	443
morphological and physiological parameters in gladiolus - Ganesh B. Kadam, Krishan P. Singh and Madan Pal	379	Detection of <i>Flavescence Dorée</i> phytoplasma in ampelographic collection at Iaşi, Romania – N. Irimia, E. Ulea and F.D. Lipşa	446
Chemical composition and antifungal activity of essential oils against die-back of hippeastrum – A. Muthukumar and K. Sanjeev Kumar	385	Performance of heliconia under coconut garden and open field conditions – K. Ramachandrudu and M. Thangam	450

Published by Dr K.L. Chadha and edited by Dr S.K. Singh for the Horticultural Society of India, F1, National Society's Block, National Agricultural Science Centre Complex, Todapur, Pusa Campus, New Delhi - 110 012, India and printed at Malhotra Publishing House, B-6, DSIDC Packaging Complex, Kirti Nagar, New Delhi 110 015, India.

Volume 69, No. 4 December, 2012

Print: ISSN 0972-8538 Online: ISSN 0974-0112

Indian Journal of

Horticulture



Estd. 1942

The Horticultural Society of India Indian Agricultural Research Institute New Delhi-110 012

Website: www.hsi1942.in



Overseas distribution
IOS Press, The Netherlands

CONTENTS

		~	
Molecular marker-based genetic variability among Yellow Leaf Disease (YLD) resistant and susceptible arecanut (<i>Areca catechu</i> . L.) genotypes – R. Manimekalai, K.P. Deeshma, K.P. Manju, V.P. Soumya, M. Sunaiba, Smitha Nair and K.S.		Correlation and path coefficient analysis for quantitative and qualitative traits for fruit yield and seed yield in tomato genotypes – Bhavana Sharma and J.P. Singh	540
Ananda Effect of pre-harvest chemical treatments and mulching on quality and marketability of Dashehari	455	Effect of nitrogen levels and cultivars on growth and yield components of potato in foot hills of Arunachal Pradesh – Rakesh K. Dubey, Vikas Singh, Kamala Devi and Katon Kartek	545
mango – A.K. Singh, C.P. Singh and P. Chauhan Growth, yield and quality of vegetable banana Monthan (Banthal-ABB) in relation to NPK fertigation – Dinesh Kumar, V. Pandey and Vishal Nath	462 467	Effect of organic and inorganic sources of nutrients on growth, yield and quality of sprouting broccoli cv. CBH-1 – Santosh Choudhary, A.K. Soni and N.K. Jat	550
Evaluation of guava varieties for growth, yield and quality attributes in Malwa Plateau conditions of Madhya Pradesh – Manoj K. Mahour, Rajesh		Studies on heterosis using heat tomato tolerant lines – Amit K. Gaikwad and D.S. Cheema <i>In vitro</i> isolation of red coloured mutant from	555
Tiwari and B.S. Baghel Growth, yield and quality of rejuvenated guava as influenced by thinning-bending and micronutrients	472	chimeric ray florets of chrysanthemum induced by gamma-ray – Arvind K. Verma, K.V. Prasad, S.K. Singh and Surendra Kumar	562
K.L. Kumawat, D.K. Sarolia and A.K. Shukla Effect of hot water treatment and oxalic acid on colour retention and storage quality of litchi fruit	478	Effect of fertigation on nutrient uptake on anthurium – Jhuma Das, Madhumita Choudhury Talukdar and Pradip Mahanta	568
cv. Rose Scented – E.S. Marboh, R.L. Lal, D.S. Mishra and A.K. Goswami	484	Leaf characters of betelvine (<i>Piper betle</i> L.) as influenced nitrogen application – Anupam Pariari	
Establishment of diagnosis and recommendation integrated system norms for plum cv. Santa Rosa – Disha Thakur, A.S. Rehalia and J. Kumar	489	and Munsi N. Imam Effect of cultivar, harvesting stage and storage period on the quality of mango during natural	573
Studies on the effect of season, radial distance and depth on root distribution in guava cv. Allahabad Safeda – N. Singh, V.M. Prasad, B. Bangari, S.		ripening - S.N. Jha, P. Jaiswal, K. Narsaiah, R. Sharma, R. Kumar, A. Basedia and P.P. Kaur	578
Uniyal and K.K. Misra	495	Effect of pre-treatments and drying temperatures on the quality of dehydrated mango slices – D.B. Singh and R.K. Goyal	500
Impact of organic manures and inorganic fertilizers on growth, yield, nutrient uptake and soil nutrient status in guava – Y.V. Trivedi, N.L. Patel, T.R.		Short communications	586
Ahlawat, S.S. Gaikwad and P.P. Bhalerao Standardization of leaf sampling technique for macro- and micro-nutrient elements in plum under temperate	501 507	Essential oil, fatty oil and seed yield of nigella (<i>Nigella sativa</i> L.) as influenced by sowing dates and crop geometry – S.S. Meena, R.S. Mehta, G. Lal, K. Kant, Y.K. Sharma, S.N. Saxena and M.M. Anwer	504
conditions – M.K. Sharma and H.U. Rehman Effect of foliar sprays of potassium on fruit size and quality of 'Patharnakh' pear – P.P.S. Gill, M.Y.	507	Bulb yield and nutrient uptake by onion as affected by weed control – Sangeeta Kumari and S.P. Singh	591 594
Ganaie, W.S. Dhillon and Nav Prem Singh	512	Studies on vegetative propagation of <i>Rosa canina</i> – Z. Izadi, H. Zarei and M. Alizadeh	598
Genetic diversity of Indian brinjal revealed by RAPD and SSR markers – Manjusha Verma, Saurabh Rathi, A.D. Munshi, Arun Kumar, Lalit Arya, K.V. Bhat and Ravinder Kumar	517	Effect of plant bioregulators on vegetative and floral attributes of gladiolus – Kavita Joshi, Satish Chand, Ranjan Srivastava and Babita Singh	602
Utility of gynoecious sex form in heterosis breeding of bitter gourd and genetics of associated vegetative and flowering traits – S.S. Dey, T.K. Behera, A.D.	EOO	Evaluation of gerbera cultivars under naturally ventilated polyhouse – T.R. Ahlawat, A.V. Barad, and Giriraj Jat	606
Munshi, S. Rakshit and R. Bhatia Prediction of heterosis based on genetic divergence in tomato – Ravindra Mulge, Praveen Mahendrakar and S.J. Prashanth	523 530	Whole tomato concentrate - A value-added tomato product for small scale enterpreneur - S. Bhuvaneswari and K.P. Gopalakrishna Rao	609
Multivariate analysis in relation to breeding system in okra – B. Singh, Ravishankar Singh and S.K. Sanwal	550	Hort Horizons List of Referees	i
	536	Book Review	11 111

Published by Dr K.L. Chadha and edited by Dr S.K. Singh for the Horticultural Society of India, F1, National Society's Block, National Agricultural Science Centre Complex, Todapur, Pusa Campus, New Delhi 110 012, India and printed at Malhotra Publishing House, B-6, DSIDC Packaging Complex, Kirti Nagar, New Delhi 110 015, India.

Book Review

iii

Sanwal