

Scientific Program

Keynote and Invited Lectures, Oral sessions

16 (Mon) AM

9:30 - 9:50 **Opening** **Room C**

10:00 - 11:00 **Keynote Lecture** **Room C**

Chairpersons: Jorunn E. Olsen & Kenji Kurata

16K11 Hemming, Silke Use of natural and artificial light in horticulture - interaction
(Netherlands) of plant and technology

11:00 - 12:00 **Keynote Lecture** **Room C**

Chairpersons: Jorunn E. Olsen & Kenji Kurata

16K12 Watanabe, Hiroyuki Light-controlled plant cultivation system in Japan - History,
(Japan) today's developments and the future

12:00 **Group Photograph** **Entrance Hall**

12:20 - 13:20 **Luncheon** **Room B**

Seminar (1)

CCS Inc.

16 (Mon) PM

13:30 - 14:10 Invited Lecture Room A

Chairpersons: Ep Heuvelink & Makio Hayashi

- 16K21 Goto, Eiji Production of pharmaceutical materials using genetically modified plants grown with artificial lighting
(Japan)

14:20 - 15:40 Oral Session Room A

Impact of light on edible and medicinal products and the nutritional properties

Chairpersons: Andre Gosselin & Wakanori Amaki

- 16A21 Kojima, Masanobu Blue light stress on buckwheat sprouts causes both
(Japan) anthocyanin accumulation and vacuolar acidification
- 16A22 Zukauskas, Arturas Improvement of the nutritional quality of leafy vegetables
(Lithuania) using solid-state illumination
- 16A23 Hassani Malayeri, Growth and photosynthetic rate of Japanese mint (*Mentha*
Sara *arvensis*) grown under controlled environment
(Japan)
- 16A24 Hikosaka, Shoko Effects of UV light on growth, essential oil concentration and
(Japan) total antioxidant capacity of Japanese mint (*Mentha*
 arvensis L.)

14:20 - 15:40 Oral Session Room B

Manipulation of light in greenhouses and growth rooms

Chairpersons: Wei Fang & Yasuhiro Ishigami

- 16B21 Dueck, Tom A. Diffuse light enhances greenhouse climate and increases
(Netherlands) production in cucumber
- 16B22 Trouwborst, Govert Inter-lighting with LEDs in greenhouse grown cucumber
(Netherlands)
- 16B23 Hoshi, Takehiko Effect of supplemental lighting for raising seedling period in
(Japan) a greenhouse on the tomato seedling quality
- 16B24 Hao, Xiuming Growing mini-cucumbers with supplemental lighting:
(Canada) additional blue light, grow pipe heating, and ca nutrition
-

15:40 - 16:10 Coffee Break Exhibition and Poster Hall

16:10 - 17:30	Oral Session	Room A
	<i>Impact of light on edible and medicinal products and the nutritional properties</i>	
	<i>Chairpersons: Yoshiaki Kitaya</i>	
16A31	Hikosaka, Shoko (Japan)	Effects of light quality and photosynthetic photon flux density on growth and carotenoid pigments in spinach (<i>Spinacia olerance</i> L.)
16A32	Naznin, Most Tahera (Japan)	Growth and ajoene concentrations of garlic plants cultured in a hydroponic system and a soil system at different light intensities
16A33	Yoshida, Hideo (Japan)	Effect of light intensity on secondary metabolite content, growth, and development in <i>Perilla frutescens</i>
16A34	Okayama, Tsuyoshi (Japan)	The effect of light intensity on β -glucuronidase gene expression under control CaMV-35S promoter in transgenic leaf lettuce
16:10 - 17:10	Oral Session	Room B
	<i>Light environments in greenhouses</i>	
	<i>Chairpersons: Jung Eek Son & Takehiko Hoshi</i>	
16B31	Castilla, N. (Spain)	Global radiation differences under a glasshouse and a plastic greenhouse in Almeria (Spain): Preliminary report
16B32	Pchelin, Vladimir M. (Russia)	Increase of efficiency of horticultural lighting
16B33	Ibaraki, Yasuomi (Japan)	Estimation of light intensity distribution on canopy surface using reflection images in greenhouse

17 (Tue) AM

09:10 - 09:50 Invited Lecture Room A

Chairpersons: Masumi Okada

- 17K11 Shahak, Yosepha General overview on photoselective crop protection (Israel)

10:00 - 12:00 Oral Session Room A

Interactions between light and other growth factors on growth and development

Chairpersons: Nicolas Castilla & Shoko Hikosaka

- 17A11 Olsen, Jorunn Elisabeth (Norway) Modulation of gibberellin physiology is necessary for thermoperiodic control of shoot elongation, but does not affect photosynthetic or respiratory capacities
- 17A12 Nichols, Michael Adair (New Zealand) Towards developing an optimum environment for plant factories
- 17A13 Heuvelink, Ep (Netherlands) Light use efficiency of greenhouse tomato crops in spring higher than in autumn
- 17A14 Losciale, Pasquale (Italy) Effect of moderate light reduction on absorbed energy management, water use, photoprotection and photo-damage in peach
- 17A15 Qin, Feifei (Japan) Photosynthetic responses to PPF, temperature and humidity in *Panax ginseng* plants
- 17A16 Hao, Xiuming (Canada) Lighting in high-wire cucumber production on raised-troughs: interactions with other growth factors

10:20 - 12:00 Oral Session Room B

Photoselective films and colored nets for greenhouse or field production

Chairpersons: Yosepha Shahak & Eiji Goto

- 17B15 Ben-Yakir, David (Israel) Protection of greenhouse crops from insect pests and viral diseases using UV- blocking cladding materials
- 17B11 Liu, Sainan (Japan) Growth and quality of spinach (*Spinacia olerance* L.) and chingensai (*Brassica campestris* L.) grown under different photo-selective covering materials
- 17B12 Liu, Houcheng (China) Effects of different shading-net on growth and quality of flowering Chinese cabbage
- 17B13 Ben-Yakir, David (Israel) Developing nets containing photo-selective additives for protecting crops against insect pests

17B14	Stapel, Oscar (France)	The use of light filters in ornamental plant production to control plant growth and to improve plant quality
-------	---------------------------	--

12:10 - 13:10	Luncheon Seminar (2) AGC GREEN-TECH CO., LTD	Room B
----------------------	--	---------------

17 (Tue) PM

13:30 - 14:10 Invited Lecture Room A

Chairpersons: Hans-Jurgen Tantau & Sadanori Sase

- 17K21 Runkle, Erik Energy-efficient greenhouse lighting of ornamentals
(U.S.A.)

14:20 - 15:20 Oral Session Room A

Growth responses under various light conditions

Chairpersons: Tom A. Dueck & Masuyuki Takaichi

- 17A21 Kjar, Katrine Diel changes in leaf growth activity of chrysanthemums in
Heinsvig response to light intensity and abrupt changes in the onset
(Denmark) of day
- 17A22 Takaichi, Masuyuki Characteristics of daytime decrease in fresh weight of
(Japan) tomato plants grown in hydroponics and estimation of the
 effectiveness of shading
- 17A23 Murakami, Plant growth under white LEDs compared with under
Katsusuke fluorescent lamps
(Japan)

14:20 - 15:20 Oral Session Room B

New equipments and technologies for lighting

Chairpersons: Hiroyuki Watanabe

- 17B21 Fang, Wei Development of LED Lids for Tissue Culture Lighting
(Taiwan)
- 17B22 Tanaka, Michio Acclimatization of *Phalaenopsis* and *Cymbidium* plantlets
(Japan) cultured in vitro by using a low power consumption lighting
 system (SILHOS) with hydroponic system in
 temperature-controlled chamber
- 17B23 Ishigami, Yasuhiro Development of a production system equipped with a
(Japan) high-intensity light source for GM crops
-

15:20 - 15:50 Coffee Break Exhibition and Poster Hall

15:50 - 17:10	Oral Session	Room A
	<i>Supplemental lighting</i>	
	<i>Chairpersons: Erik Runkle & Limi Okushima</i>	
17A31	Suzuki, Katsumi (Japan)	Effect of the supplemental lighting on the growth of young plant on second nursery in tomato
17A32	Lu, Na (Japan)	The yield enhancements of single truss tomato plants grown in super-high densities with supplemental lighting from LED at different growth stages
17A33	Matsuda, Ryo (Japan)	Effects of supplementary assimilation light on growth and yield of greenhouse tomato: An experiment and model validation
17A34	Chang, Ming-Yih (Taiwan)	Effect of artificial light supplement in transcontinental sea cargo on the flowering of young spiking <i>Phalaenopsis</i>
15:50 - 17:10	Oral Session	Room B
	<i>Artificial light sources such as LEDs and advanced lighting devices</i>	
	<i>Chairpersons: Kazuhiro Fujiwara</i>	
17B31	Murakami, Katsusuke (Japan)	Design and arrangement of light emitting diodes for plant growth facilities
17B32	Bornwaser, Thorsten (Germany)	Evaluation of high power LEDs with an integrating sphere for artificial lighting in horticulture
17B33	Bornwaser, Thorsten (Germany)	LED lighting systems in growing rooms - Optimization of the energy efficiency
17B34	Asada, Takashi (Japan)	Fourth prototype of an LED-artificial sunlight source system capable of controlling spectral power distribution

18:00 **Banquet bus departure** **Entrance Hall**

18:30 - 20:30 **Banquet**

18 (Wed) AM

09:00 - 09:40	Invited Lecture	Room A
	<i>Chairpersons: Tamotsu Hisamatsu</i>	
18K11	King, Rod (Australia)	How plants respond to different light conditions
10:10 - 12:10	Oral Session	Room A
	<i>Light condition and floral induction</i>	
	<i>Chairpersons: Rod King & Tamotsu Hisamatsu</i>	
18A11	Fukuda, Naoya (Japan)	Effects of light quality under red and blue light emitting diodes on the growth and the expressions of <i>FBP28</i> in petunia
18A12	Kanayama, Yoshinori (Japan)	Molecular mechanism in the control of flowering by light quality in <i>Gypsophila paniculata</i> and <i>Arabidopsis</i>
18A13	van Ieperen, Wim (Netherlands)	Flowering preserved in short-day chrysanthemum plants grown under long-day conditions using PAR with a variable spectrum over the day
	<i>Light condition and floral induction</i>	
	<i>Chairpersons: Naoya Fukuda</i>	
18A14	Dueck, Tom A. (Netherlands)	Comparison of LED and HPS lighting in two cut flowers: Chrysanthemum and rose
18A15	Kanayama, Yoshinori (Japan)	Promotion of flowering by Far-Red light-emitting diodes in <i>Gypsophila paniculata</i> and other cut flowers
18A16	Wu, Chia-Chyi (Taiwan)	Effect of light environment on runner plant propagation of strawberry
09:50 - 12:10	Oral Session	Room B
	<i>Photosynthesis and growth</i>	
	<i>Chairpersons: Keiko K. Ohashi</i>	
18B11	Cummings, Ian Gregory (Australia)	Red to far-red ratio correction in plant growth chambers
18B12	liu, xiaoying (China)	Effect of different light quality of LED on growth and photosynthetic character of cherry tomato seedling
18B13	Marcelis, Leo (Netherlands)	Spectral dependence of photosynthesis at the leaf and canopy level

Photosynthesis and growth

Chairpersons: Leo Marcelis & Yasuomi Ibaraki

18B14	Xu, Hui-lian (Japan)	Responses of photosynthesis to changing light Intensities in leaves of tomato plants grown with different fertilizations
18B15	Ohashi, Keiko K. (Japan)	Gas exchange characteristics and nitrogen utilization in rice and spinach leaves under blue light and red light
18B16	Hogewoning, Sander W. (Netherlands)	Unraveling light spectrum effects on leaf photosynthesis and plant morphology
18B17	Takayama, Kotaro (Japan)	Health condition monitoring of tomato plants in greenhouse with chlorophyll fluorescence imaging system

12:20 - 13:20 Luncheon Room B
Seminar (3)
PS COMPANY LTD.

18 (Wed) PM

13:30 - 14:30 Poster Session Exhibition and Poster Hall
(1)
odd number

14:30 - 15:30 Poster Session Exhibition and Poster Hall
(2)
even number

15:30 - 15:50 Coffee Break Exhibition and Poster Hall

16:00 - Closing Room A

Poster sessions

18 (Wed) PM

13:30 - 14:30 18P-odd number Exhibition and Poster Hall

14:30 - 15:30 18P-even number Exhibition and Poster Hall

Growth responses under various light conditions

- | | | |
|-------|---------------------------------------|--|
| 18P01 | Haj Seyed Hadi, M.
(Iran) | Eradiation use efficiency of potato in response to weed competition |
| 18P02 | Sysoeva, Marina
(Russia) | Evolution of photoperiodism and plants |
| 18P03 | Hamamoto, Hiroshi
(Japan) | Supplemental lighting inside the plant canopy increased the yield and quality of three-truss-ordered tomato |
| 18P04 | Xu, Hui-lian
(Japan) | Photosynthetic oscillation in leaves of tomato and hibiscus under high light intensity |
| 18P05 | Kasajima, Shinya
(Japan) | Hypocotyl elongation of lettuce and chinese cabbage seedlings exposed to different light qualities |
| 18P06 | Mizuno, Takayuki
(Japan) | Effects of Monochromatic Light Irradiation by LED on the growth and anthocyanin contents in leaves of cabbage seedlings |
| 18P07 | Nakano, Yoko
(Japan) | Suppression effect of blue light on the growth of oyster mushroom mycelia |
| 18P08 | Kuniga, Takeshi
(Japan) | UV-C radiation affects accumulation of scoparone in citrus |
| 18P09 | Baba, Teruaki
(Japan) | Effect of supplementary lighting during night time on ascorbic acid content of japanese bunching onion sprout under natural light conditions |
| 18P10 | Harada, Sachie
(Japan) | Root vegetable production under hybrid electrode fluorescent lamp (HEFL) |
| 18P11 | Nozue, Hatsumi
(Japan) | An approach to improving plant productivity by use of a LED unit equipped with control modules |
| 18P12 | Werner, Jeffrey W
(USA) | Using light emitting diodes in high latitude greenhouse production |
| 18P13 | Park, Jongseok
(Republic of Korea) | Radish growth under dim lighting to root-zone by LEDs |
| 18P14 | Duan, Qingqing
(China) | Effects of short-term darkness on leaf chloroplast structure and senescence of watermelon seedlings |
| 18P15 | Son, Jung Eek
(Republic of Korea) | Growth of potato plantlets in a nutrient-circulated micropropagation system with supporting materials under |

- fluorescent lighting
- 18P16 Nishiyama, Manabu Effect of LED light on growth of everbearing strawberry
(Japan) plant
- 18P17 Jiang, Wu Effect of light intensity on recovery of watermelon seedlings
(China) after storage in darkness
- 18P18 Homma, Tomoo Effects of continuous irradiation of LED light on growth of
(Japan) young tea plants
- 18P19 *Cancelled*
- 18P20 Nishiyama, Effect of light qualities on the growth of rocket salad (*Eruca*
Yoshitaka *vesicaria*) under new high performance LED panels
(Japan)
- 18P21 Hayakumo, Mariko Effects of light source spectral distribution on
(Japan) photosynthetic rate and vegetative growth of rice plants
- 18P22 Oliveira, Ana Physiological responses and fruit composition of two red
Fernandes de (Italy) grape varieties under different light regimes
- 18P23 *Cancelled*
- 18P24 Yang, Qichang Influence of R/B ratio in LED lighting on physiology and
(China) quality of lettuce

Light and micropropagation

- 18P25 Hamada, Kazutoshi Effects of red, blue and yellow fluorescent films on
(Japan) proliferation and organogenesis in *Cymbidium* and
Phalaenopsis PLB in Vitro
- 18P26 Hamada, Kazutoshi Applicability of a newly developed field emission lamp for
(Japan) proliferation of cymbidium PLB In vitro
- 18P27 Lee, Yung-I Effect of six different led light qualities on the seedling
(Taiwan) growth of *Paphiopedilum* orchid in vitro
- 18P28 Lee, Yung-I Histological observation on the growth of potato plantlet in
(Taiwan) vitro under six different led light qualities
- 18P29 Yang, Qichang The effects of LED light quality R/B on sweet potato tissue
(China) culture plantlets

Light and gene expression

- 18P30 Okushima, Limi Microarray analysis of blue or yellow weak light effect to
(Japan) genes in *Arabidopsis*
- 18P31 Kawabata, cDNA Microarray analysis of differential gene expression in
Saneyuki tomato fruits exposed to blue, UV-A, and UV-A+UV-B
(Japan)

- 18P32 Fukuda, Satoshi
(Japan) Effects of quite short-term irradiation on the growth and gibberellin metabolism in *Arabidopsis thaliana* grown under blue LED light
- 18P33 Ehara, Mitsushige
(Japan) Expression of flavonoid biosynthesis genes in response to light in an *Arabidopsis* flavonoid mutant

Light condition and floral induction

- 18P34 Matsuzono, Rieko
(Japan) Effect of night break treatment on growth and flowering in *Dendrobium Phalaenopsis*
- 18P35 Sumitomo,
Katsuhiko
(Japan) Effect of end-of-day far-red light treatment on flowering and stem elongation in some cut flowers
- 18P36 Koike, Yasuhiko
(Japan) Effects of photoperiod on flowering of *Quamoclit lobata* House.
- 18P37 Yamazaki, Keisuke
(Japan) Effect of light quality for supplemental lighting during runner-cooling treatment on flowering of strawberry in forcing culture
- 18P38 Rantanen, Marja
Matilda
(Finland) Light quality affects runner formation and flower induction in strawberry (*Fragaria vesca*)
- 18P39 Yamada, Asuka
(Japan) Effects of red: far-red light ratio using long-day treatment on growth and flowering in *Eustoma grandiflorum* (Raf.) Shinn
- 18P40 Sato, Takeyoshi
(Japan) Effect of day-extension treatments with far-red light on flowering of *Eustoma grandiflorum* in early winter
- 18P41 Hisamatsu,
Tamotsu
(Japan) Mysterious effect of blue light on flowering in chrysanthemum
- 18P42 Padhye, Sonali
Ramesh
(USA) Flowering time and quality of long-day plant *Ageratum houstonianum* in response to limited inductive photoperiod
- 18P43 Fukui, Hirokazu
(Japan) Effect of red LED Lamp with wavelength of 660nm on floral bud differentiation of chrysanthemum
- 18P44 Ieperen, Wim van
(India) Effects of day length extension on growth and flowering in *Chrysanthemum morifolium* cvs. Zembla and LeMans

Impact of light on edible and medicinal products and the nutritional properties

- 18P45 Kobashigawa,
Chiaki
(Japan) Effect of UV-C treatment on plant growth and nutrient contents

- 18P46 Zukauskas, Arturas (Lithuania) Effect of supplementary pre-harvest LED lighting on the antioxidant properties of lettuce varieties
- 18P47 Amaki, Wakanori (Japan) Effects of light quality on the growth and essential oil content in sweet basil
- 18P48 Murakami, Kenji (Japan) Low-pungent sweet pepper selected under continuous fluorescent illumination
- 18P49 Hirano, Katsuteru (Japan) Effect of ultraviolet-A irradiation on plant growth and nutritional content of vegetables
- 18P50 Sukegawa, Kazuhiro (Japan) Effect of ultraviolet-A irradiation on the quality of harvested agricultural products during the drying process
- 18P51 Watanabe, Hiroyuki (Japan) Effects of light qualities on geraniin production in *Geranium thunbergii*
- 18P52 Shoji, Kazuhiro (Japan) Effect of light quality on the polyphenol content and antioxidant activity of sweet basil (*Ocimum basilicum* L.)

Interactions between light and other growth factors on growth and development

- 18P53 Sysoeva, Marina (Russia) Effect of photoperiod and temperature drop on cold resistance and biological productivity in cucumber plants
- 18P54 Baninasab, Bahram (Iran) Responses of wild celery (*Apium graveolens*) seeds to light and temperature
- 18P55 Sukhumpinij, Pornpan (Japan) Effect of auxin-cytokinin interaction and light conditions on organogenesis in mature leaf explants of *Pelargonium rapaceum* (L.) L'Hérit
- 18P56 Krumbein, Angelika (Germany) Temperature and global radiation influence the concentration and composition of flavonoids in kale (*Brassica oleracea* var. *sabellica*)
- 18P57 Gishi, Masanori (Japan) Effect of light quality and nutrients on growth of Hydrocarbon-rich Microalgae, *Botryococcus braunii*
- 18P58 Yasuba, Ken-ichiro (Japan) Influence of humidity control for decreasing air temperature without shading on light environment and leaf temperature in a greenhouse
- 18P59 Nakano, Akimasa (Japan) Characteristics of carbon and nitrogen distribution of the Dutch and Japanese tomato communities
- 18P60 Higashide, Tadahisa (Japan) Management of periodic nutrient supply independent of water supply based on solar radiation and crop models in a soilless culture

Light environments in greenhouses

- 8P61 Qin, Feifei Light penetration and leaf photosynthesis in canopy of
(Japan) tomato and *Aralia cordata* in comparison with wheat
- 18P62 *Cancelled*
- 18P63 Oka, Masaaki Development of simulation software for evaluating
(Japan) light-interception efficiency of tomato canopy

Manipulation of light in greenhouses and growth rooms

- 18P64 Aberkani, Kamal Light transmission and spectral quality achieved with a
(Canada) retractable liquid foam injected between double
polyethylene film layers for greenhouse shading and
insulation

New equipments and technologies for lighting

- 18P65 Inden, Haruhisa The low cost plant factory using hybrid electrode
(Japan) fluorescent lamp (HEFL)

Artificial light sources such as LEDs and advanced lighting devices

- 18P66 Yano, Akira Controllable spectrum portable lighting system using LEDs
(Japan) with 32 different peak wavelengths
- 18P67 Beemster, Jos Development of a new application for measuring UV, PAR,
(Netherlands) IR, light spectrum, radiation and leaf temperature

Photosensitive films and colored nets for greenhouse or field production

- 18P68 Palonen, Pauliina Raspberry growth and cropping may be influenced by far
(Finland) red light absorbing film
- 18P69 Ooyama, Haruka Development of new wavelength conversion films including
(Japan) fluorescent dyes and their photophysical properties and
light stability
- 18P70 Bastias, Richard M. Physiological aspects on photosensitive nets in apples:
(Italy) Preliminary studies
- 18P71 Trunov, Yuriy V. The light conditions under protected coloured hailnets
(Russia) affects leaf and fruit temperature, leaf anatomy, vegetative
and productive growth as well as fruit colouration in apple
- 18P72 Schoondergang, Greenhouse shading: Making optimal use of natural light
Marcel
(Netherlands)

Control of pest and disease using artificial lights

- | | | |
|-------|---------------------------------------|--|
| 18P73 | Aruppillai,
Suthaparan
(Norway) | Day length extension and red light strongly reduces powdery mildew in greenhouse roses |
| 18P74 | Kudo, Rika
(Japan) | Effect of green light irradiation on induction of disease resistance in plant. |
| 18P75 | Schwarz, Dietmar
(Germany) | Light determines the confinement of a pathogen by an antagonistic endophyte |
-