

XVIII International Plant Nutrition Colloquium 2017 Location: Tivoli Congress Center, Copenhagen, Denmark	
17:00-21:00	20 August, Sunday Registration and poster mounting Welcome reception from 19:30 – Tivoli Foyer
21 August, Monday	
9:00-10:20	Opening session – Tivoli Congress Hall Chair: Ismail Cakmak, Turkey Past President of the International Plant Nutrition Council 9:00-9:10 Welcome by Jan K. Schjoerring, Denmark Chairman of the Colloquium and President of International Plant Nutrition Council 9:10-9:20 Welcome by Thomas Bjørnholm, Denmark Pro-rector for Research, University of Copenhagen 9:20-9:40 H.C. Andersen parade 9:40-10:20 Opening plenary presentation Plant nutrition for global green growth - Designing next generation fertilizers for crop nutrition Mike McLaughlin, Australia
10:20-10:50	Coffee break and poster viewing (Theme 1-2)
10:50-12:30	Plenary keynote presentations – Tivoli Congress Hall Chair: Walter Horst, Germany 10:50-11:15 Exploiting the root-soil microbiome for benefit to plant nutrition Alan E. Richardson, Australia 11:15-11:40 Phosphorus promotes nitrogen fixation in soybean Hong Liao, China 11:40-12:05 Non-mycorrhizal strategies to acquire phosphorus from soils with very low phosphorus availability Hans Lambers, Australia 12:05-12:30 Plant nutrients - The functional ionome Philip White, UK
12:30-14:00	Lunch, poster viewing and speakers corner (Theme 1-2)

21 August, Monday		
	Parallel sessions	
14:00-15:45	Theme 1: Plant-microorganism interactions and nutrient acquisition – Tivoli Congress Hall Chair: Iver Jakobsen, Denmark	Theme 2: Nutrient functions in plants – Carstensen Auditorium Chair: Toru Fujiwara, Japan
14:00-14:15	Bio-effectors for alternative plant nutrition strategies: practical aspects for successful applications in crop production Günther Neumann, Germany	Potassium supply mitigates photo-oxidative damage under osmotic stress by avoiding ROS generation and improving metabolism Ershad Tavakol, Germany
14:15-14:30	A quantitative analysis of phosphorus acquisition efficiency of direct pathway and mycorrhizal pathway of maize Gu Feng, China	Photoprotective responses and PSII functionality under magnesium deficiency Merle Tränkner, Germany
14:30-14:45	The root external mycelium of mycorrhizal fungi has a key role in plant nutrition but is suppressed by the soil microbiota Carla Cruz Paredes, Denmark	Functional impacts of phosphorus deficiency on the photosynthetic machinery Andreas Carstensen, Denmark
14:45-15:00	Identifying the mechanisms behind mycorrhiza-enhanced plant zinc nutrition Stephanie Watts-Williams, Australia	Frost increases internal potassium requirements for alleviation of sterility and grain yield of wheat Richard Bell, Australia
15:00-15:15	Small signalling peptides – New regulators of symbiotic interactions Thomas de Bang, Denmark	Limiting physiological processes for maize growth under magnesium deficiency Stephan Jung, Germany
15:15-15:30	Complementarity between citrate and phytase exudation enhances acquisition of soil phosphorus by plants Timothy George, UK	Potassium–silicon interaction under drought stress condition in barley Seyed Abdollah Hosseini, France
15:30-15:45	Do bioeffectors matter? - A meta-analysis of more than 150 experiments Jonas Duus Stevens Lekfeldt, Denmark	Sulfur deficiency negatively affects nitrate root-to-shoot translocation and leaf cytokinin concentration in wheat Jose Maria García-Mina, Spain
15:45-16:45	Coffee break, poster viewing and speakers corner (Theme 1-2)	

21 August, Monday	
16:45-18:00	<p>Marschner session: Nurturing the future – Tivoli Congress Hall Chair: Jan K. Schjoerring, Denmark</p> <p>16:45-17:00 Award ceremony</p> <p>17:00-17:15 Role of soil micronutrients and fertilizer management in crop nutrition under variable smallholder cropping Muneta Grace Manzeke, Zimbabwe</p> <p>17:15-17:30 Identification of transporters involved in metal stress tolerance in plants Kengo Yokosho, Japan</p> <p>17:30-17:45 Proteaceae from severely phosphorus-impooverished habitats preferentially allocate phosphorus to photosynthetic cells Patrick E. Hayes, Australia</p> <p>17:45-18:00 Multi-dimensional stable isotope analysis – A novel analytical tool in plant nutrition Kristian Holst Laursen, Denmark</p>
18:00-18:10	<p>18:00-18:10 SOPIB Award ceremony Chair: Michel Marchand, France SOPIB Awardee: Dilek Anaç, Turkey</p>
Evening	Poster viewing and welcome reception – City Hall

22 August, Tuesday	
8:30-10:10	<p>Plenary keynote presentations – Tivoli Congress Hall Chair: Patrick Brown, USA</p> <p>8:30-8:55 A paradigm of nutrient management for fertilizer industry and global society Fusuo Zhang, China</p> <p>8:55-9:20 Factors affecting the permeability and efficacy of foliar fertilisers: An update Victoria Fernandez, Spain</p> <p>9:20-9:45 Molecular mechanisms for distribution of mineral elements in plants Jian Feng Ma, Japan</p> <p>9:45-10:10 Silicon mediates ion uptake, transport and homeostasis in plants under mineral stress Miroslav Nikolic, Serbia</p>
10:10-10:45	Coffee break and poster viewing (Theme 3-4)

22 August, Tuesday		
	Parallel sessions	
10:45-12:30	Theme 3: Nutrient management and fertilizers in crop production – Tivoli Congress Hall Chair: Karl H. Muehling, Germany	Theme 4: Nutrient uptake, transport and homeostasis – Carstensen Auditorium Chair: Nicolaus von Wirén, Germany
10:45-11:00	From research to farmers: An example of knowledge transfer on potassium benefit in Turkey Dilek Anaç, Turkey	Iron-nicotianamine transporters regulate long distance shoot to root signalling of iron deficiency in Arabidopsis Elsbeth Walker, USA
11:00-11:15	Efficiency of foliar applications of potassium sulphate on field crop production Michel Marchand, France	The iron-chelate transporter OsYSL9 is crucial in iron distribution in developing rice grain Naoko Nishizawa, Japan
11:15-11:30	Establishing high-yielding maize system for sustainable intensification in China Xinping Chen, China	Associative transcriptomics reveals potential new targets for calcium and magnesium uptake in <i>Brassica napus</i> Thomas Alcock, UK
11:30-11:45	Proximal and remote quantification of nitrogen fertilizer demand – A case study in sugar beet Frank Liebisch, Switzerland	Increasing rice nitrogen use efficiency by altering nitrate transporter activity Guohua Xu, China
11:45-12:00	Effects of split nitrogen application on grain protein concentration and composition in winter wheat at different nitrogen fertilisation rates Anne Rossmann, Germany	The kinase CIPK23 inhibits ammonium transport in <i>Arabidopsis thaliana</i> Benjamin Neuhäuser, Germany
12:00-12:15	Nutrient management increases crop water use efficiency Dejene Eticha, Germany	The strigolactone transporter PDR1 as a tool to enhance plant yield on nutrient poor soil Lorenzo Borghi, Switzerland
12:15-12:30	Comparing ammonium sulfate to recent sulfur fertilizers in sulfur availability to crop growth S.H. (Norman) Chien, USA	Cis- and epi-regulation of amino acid transporters contribute to inhibition of ear growth by nitrogen limitation in maize Xuexian Li, China
12:30-14:00	Lunch, poster viewing and speakers corner (Theme 3-4)	

22 August, Tuesday	
14:00-15:40	Plenary keynote presentations – Tivoli Congress Hall Chair: Leon Kochian, Canada
	14:00-14:25 The root endodermis acts as a gateway for vascular transport David E. Salt, UK
	14:25-14:50 AMT-type transporters mediate radial transport pathways and root-to-shoot translocation of ammonium Nicolaus von Wirén, Germany
	14:50-15:15 Making waves ... Einstein's lessons for crop nutrition research Paul E. Fixen, USA
	15:15-15:40 Plant nutritional challenges in an industrialized agriculture – The Danish lesson Leif Knudsen, Denmark
15:40-16:30	Coffee break, poster viewing and speakers corner (Theme 3-4)

22 August, Tuesday		
	Parallel sessions	
16:30-18:30	Theme 3: Nutrient management and fertilizers in crop production – Tivoli Congress Hall Chair: Fusuo Zhang, China	Theme 4: Nutrient uptake, transport and homeostasis – Carstensen Auditorium Chair: Patrick Bienert, Germany
	Phosphorus availability of fertilizers recycled from urban waste water in combination with bioeffectors – Pot and field experiments Iris Wollmann, Germany	Natural variation in <i>Arabidopsis thaliana</i> to identify genes underlying zinc deficiency response Valeria Ochoa, The Netherlands
16:45-17:00	Improving soil of low phosphorus availability with biochar produced from bonemeal Sander Bruun, Denmark	Zinc controls leaf length via FLOWERING LOCUS T in early-flowering <i>Arabidopsis thaliana</i> Uwe Ludewig, Germany
17:00-17:15	Rock phosphate-enriched compost in combination with PGPR; a cost-effective source for better soil health and wheat productivity Motsim Billah, Pakistan	Systemic regulation of the response to zinc deficiency Scott A. Sinclair, Germany

22 August, Tuesday		
17:15-17:30	The effects of pH on root morphology and physiology of narrow-leaf lupine, grown with a recycled phosphorus source Ana A. Robles Aguilar, Germany	Proteomic responses to zinc deficiency stress in maize (<i>Zea mays</i> L.) Wang Hong, China
17:30-17:45	BASS - A new sulfur fertilizer Diedrich Steffens, Germany	Role of trichomes, stomata, and the cuticle in the absorption of foliar-applied zinc fertiliser Cui Li, Australia
17:45-18:00	Efficiency of polyhalite as a fertilizer supplying potassium, magnesium, calcium and sulfate Uri Yermiyahu, Israel	Absorption and distribution of foliar-applied zinc (⁷⁰ Zn) in maize and wheat grown with low or adequate zinc supply Raheela Rehman, Turkey
18:00-18:15	Tomato responses to polyhalite in comparison to other conventional potassium fertilizers in Southeast Brazil Kiran Pavuluri, UK	Rice HRZ ubiquitin ligases are involved in both iron deficiency and excess responses and jasmonate signalling Takanori Kobayashi, Japan
18:15-18:30	Leaching rate of selected sulphur fertilizers; understanding selenate - sulphate competition Linxi Jiang, UK	Jack of all trades: Inositol polyphosphates regulate phosphorus and mineral cation nutrition as well as jasmonate-dependent defenses Gabriel Schaaf, Germany
Evening	Poster viewing	

23 August, Wednesday		
Plenary keynote presentations – Tivoli Congress Hall Chair: Ciro A. Rosolem, Brazil		
8:30-10:10	8:30-8:55	The role of high throughput root phenotyping in crop improvement for adaptation to acid soils Leon Kochian, Canada
	8:55-9:20	Genetic architecture of root system architecture in maize determined by genome-wide association analyses Lixing Yuan, China
	9:20-9:45	Arsenic biogeochemistry in paddy systems and impacts on crop production and quality Fang-jie Zhao, China
	9:45-10:10	Novel green fertilizers and soil amendments promoting recirculation of plant nutrients Lars Stoumann Jensen, Denmark
10:10-10:45	Coffee break and poster viewing (Theme 5-7)	

23 August, Wednesday		
	Parallel sessions	
10:45-12:30	Theme 5: Nutrient availability in soils, toxicity and remediation – Tivoli Congress Hall Chair: Rufus Chaney, USA	Theme 6: Roots and genetics of crop nutrient uptake – Carstensen Auditorium Chair: Jian Feng Ma, Japan
10:45-11:00	How does phosphorus accumulate in a clayey tropical soil under fertilizer sources and cover crops? Amin Soltangheisi, Brazil	Genetic control of root type-specific response of lateral roots to local high nitrate in maize Peng Yu, China
11:00-11:15	Bread from stone: Greenlandic glacial flour as soil amendment for tropical weathered soils Andreas de Neergaard, Denmark	Nutrient uptake-based assessment of genetic variation of nitrogen and phosphorus response in rice Yoshiaki Ueda, Japan
11:15-11:30	Effect of deoxymugineic acid application to calcareous soil compared with other chelating agents Motofumi Suzuki, Japan	Genetic variation for nitrogen responsiveness in Australian spring wheat Mamoru Okamoto, Australia
11:30-11:45	The positive effects of the Silicic Acid Agro Technology Henk-Maarten Laane, The Netherlands	Genetic variants associated with the root system architecture of oilseed rape under contrasting phosphate supply Lei Shi, China
11:45-12:00	Nutrient uptake by barley grown in chemically amended salt affected soil Ibrahim Abdulrazzaq, Iraq	Categorizing wheat genotypes for phosphorus efficiency; parameters vs methods Tariq Aziz, Pakistan
12:00-12:15	Phytoremediation by elucidating chemical compounds which alter accumulation of or response to caesium in plants Shin Ryoung, Japan	Dynamics of localised supply of nitrogen-species in soil and their relevance for root system morphology – What have we learned from Drew? Sebastian Blaser, Germany
12:15-12:30	Identification of glycosyltransferases involved in biosynthesis of hydrolyzable tannins in an aluminum-resistant eucalyptus tree Ko Tahara, Germany	Taking the phosphorus: Genetic mapping of QTLs for soybean protein, volume, seed and pod weight Gokhan Hacisalihoglu, USA
12:30-14:00	Lunch, poster viewing and speakers corner (Theme 5-7)	

23 August, Wednesday	
14:00-15:30	<p>Plenary keynote presentations – Tivoli Congress Hall Chair: Michael A. Grusak, USA</p> <p>14:00-14:25 Fighting human malnutrition with plant nutrition Ismail Cakmak, Turkey</p> <p>14:25-14:50 GeoNutrition: Spatial aspects of hidden hunger Martin R. Broadley, UK</p> <p>14:50-15:10 Identification and characterization of novel metal homeostasis genes in bread wheat Alexander Johnson, Australia</p> <p>15:10-15:30 Genotype behaviour, water management and zinc fertilization in different rice systems; their implications for grain zinc biofortification Hafeez ur Rehman, Pakistan</p>
15:30-16:00	Coffee break and poster viewing (Theme 5-7)

23 August, Wednesday			
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23 August, Wednesday		
16:45-17:00	Growth rate, crop duration, nitrogen, phosphorus and potassium accumulation of rice when grown in fertile and low-fertile soils Lalith Suriyagoda, Sri Lanka	Influence of fertilization strategies on the mineral nutrient content in cereal grains Karin Hamnér, Sweden
17:00-17:15	Effects of potassium nutrition on some physiological parameters and productivity of cotton crop under an arid environment Sagheer Ahmad, Pakistan	Soil amendments to reduce cadmium accumulation by leafy vegetables from cadmium-mineralized lockwood loam Rufus Chaney, USA
17:15-17:30	Interactive effects of bicarbonate and two types of Iranian local squash as rootstock on the nutrient uptake in cucumber plants Hamid Reza Roosta, Iran	Effects of foliar application and fertigation of potassium on yield and fruit quality of apple cv Gala Mehdi Ben Mimoun, Tunis
Evening	Poster viewing and Gala dinner – Langelinie Pavilion	

24 August, Thursday	
8:30-10:10	Plenary keynote presentations – Tivoli Congress Hall Chair: Sylvester Oikeh, Kenya
	8:30-8:55 Impact of climate change in plant nutrition Marta Vasconcelos, Portugal
	8:55-9:20 Achieving nutrient efficient cropping systems with higher productivity and lower emissions Jørgen E. Olesen, Denmark
	9:20-9:45 Imaging and molecular speciation analysis of essential plant nutrients Søren Husted, Denmark
	9:45-10:10 Synchrotron X-ray approaches for examining trace metals in plants Peter Kopittke, Australia
10:10-10:45	Coffee break and poster viewing (Theme 8-10)

24 August, Thursday		
	Parallel sessions	
10:45-12:30	Theme 8: Nutrient cycling, ecosystems and climate change – Tivoli Congress Hall Chair: Jørgen E. Olesen, DK	Theme 9: New analytical methods in plant nutrition – Carstensen Auditorium Chair: Philip White, UK
10:45-11:00	Nitrous oxide and methane emissions from paddy soils as affected by cropping systems and nitrogen management Xuejun Liu, China	Live imaging of ion movement in plants by Real-Time Radioisotope Imaging System (RRIS) Ryohei Sugita, Japan
11:00-11:15	Post-harvest N ₂ O emissions in bioenergy oilseed rape rotations regulated by soil residual nitrogen not by residue properties Sarah Köbke, Germany	Multi element bioimaging of <i>Arabidopsis thaliana</i> roots Daniel Persson, Denmark
11:15-11:30	Management of nitrogen fertilizer to reduce nitrous oxide (N ₂ O) emission and ammonia (NH ₃) volatilization from coffee plantation Ana Paula Packer, Brazil	Magnesium, but not calcium, co-localises with phosphorus in specific cell types in leaves Paula Pongrac, UK
11:30-11:45	Growth and distribution of upland NERICA rice roots in low-nitrogen management system in West Africa Sylvester Oikeh, Kenya	Revealing radial ion transport pathways in roots by combining the fluorescence activated cell sorting with inductively coupled plasma mass spectrometry Paulina Flis, UK
11:45-12:00	Closing the yield gap and improving soil fertility with fertilizer and HNUE hybrids in Sub-Saharan Africa Heather Pasley, USA	Non-destructive growth analysis identifies major differences in nitrogen response in wheat Trevor Garnett, Australia
12:00-12:15	Effect of predicted climate change on yield and quality of wheat under varied zinc and nitrogen fertilization Muhammad Asif, Turkey	Available nitrogen in upland soil can be estimated using ultraviolet light-emitting diode-induced fluorescence Koji Orii, Japan
12:15-12:30	Yield, land productivity, nitrogen use and transformations in oat beans intercrops in semi-arid region of Northeast China Xiaomin Feng, China	Photosynthetic iron-use efficiency provides a means for screening elite barley genotypes that adapt to iron deficiency with unknown mechanism Akihiro Saito, Japan
12:30-13:30	Lunch, poster viewing and speakers corner (Theme 8-10)	

24 August, Thursday		
	Parallel sessions	
13:30-14:30	Theme 8: Nutrient cycling, ecosystems and climate change – Tivoli Congress Hall Chair: Ken Giller, The Netherlands	Theme 10: Novel technologies for fertilizers and fertilization – Carstensen Auditorium Chair: Pai Pedas, Denmark
13:30-13:45	Why do smallholder farmers in Papua New Guinea, Fiji, Kiribati, The Philippines and Central West Africa not spend resources on management of soil fertility? Michael Webb, Australia	The influence of tensides on ZnIDHA 2.0 adhesion to the leaf surface of wheat canola and corn Anika Mrozek-Niećko, Poland
13:45-14:00	Nutrient status and vegetative growth in mature smallholder oil palm plantations Lotte S. Woittiez, The Netherlands	Zinc doped layered double hydroxides: A new source for zinc fertilization Sandra López-Rayó, Spain
14:00-14:15	Fertilizer recommendation method for sustainable cassava intensification Mirasol Pampolino, Philippines	Zinc distribution and localization in primed maize seeds and its translocation during early seedling development Imran Muhammad, Denmark
14:15-14:30	Influence of organic and inorganic fertilizers on the growth and yield of cabbage with different planting spacing Ashraf Islam, Bangladesh	Hyperspectral imagery for insight into large-scale indoor vertical farming April Agee Carroll, USA
14:30-15:30	Coffee break, poster viewing and speakers corner (Theme 8-10)	

24 August, Thursday	
15:30-17:00	Closing session – Tivoli Congress Hall Chair: Jan K. Schjoerring, Denmark 15:30-16:15 Africa - The plant nutritionists paradise Ken Giller, The Netherlands 16:15-16:40 Presentation of poster prizes 16:40-16:55 Introduction to the 19 th IPNC 2021 16:55-17:00 Goodbye