



**11<sup>TH</sup> PLANT GENOMICS &  
GENE EDITING CONGRESS: USA**  
**8<sup>TH</sup> PARTNERSHIPS IN BIOCONTROL, BIOSTIMULANTS  
& MICROBIOME CONGRESS: USA**  
**VERTICAL & INDOOR FARMING CONGRESS: USA**

**RALEIGH, NORTH CAROLINA, USA**  
October 21-22 2024



**#PlantGenomicsGE**

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Global Engage is pleased to announce the **11<sup>th</sup> Plant Genomics and Gene Editing Congress**, co-located with the **8<sup>th</sup> Partnership in Biocontrol, Biostimulants & Microbiome Congress** and the **Vertical & Indoor Farming Congress** which is confirmed to be held on 21-22 October 2024 in Raleigh, USA.

### Plant Genomics and Gene Editing

This year's Congress will focus on innovative strategies and advancements in plant genomics and gene editing. Academic and industry experts will share genome editing case studies in key crops including wheat, maize, rice and soybean, highlighting the latest applications for enhancing traits such as disease resistance and stress tolerance. Utilising computational approaches through plant phenotyping is a rapidly developing area of the field as well as the integration of bioinformatics, and the potential of artificial intelligence in this field. Moreover, an expert panel discussion will explore the most recent updates in genome editing policy and regulation.

### Biocontrol, Biostimulants & Microbiome

The co-located 8th Partnerships in Biocontrol, Biostimulants, and Microbiome Congress will examine case studies, focusing on new research into identifying and developing agricultural biopesticides and biostimulants on day 1. Novel platforms for developing biological products will be discussed as well as updates in biocontrol and biostimulant policies and regulation during an interactive panel discussion. Day 2 of this congress will focus on the plant microbiome where the symbiotic relationships between microbes and plants will be reviewed through case studies in plant and soil microbiomes as well as bacterial-fungal interactions. Academic and industry leaders will present new findings on the rhizosphere, phyllosphere, and endosphere and the application of plant and soil microbiome research in improving stress resistance, nutrient acquisition, crop yield, and tolerance to abiotic and biotic stress.

### Vertical & Indoor Farming

Vertical & Indoor Farming is a new co-located congress for 2024, exploring the latest developments in controlled environmental agriculture. Leading vertical farming companies will demonstrate their case studies in indoor farming. There will also be a panel discussion exploring the future of vertical farming including the current challenges and how these can be overcome.

	11 <sup>th</sup> Plant Genomics & Gene Editing Congress	8 <sup>th</sup> Partnership in Biocontrol, Biostimulants & Microbiome Congress	Vertical & Indoor Farming Congress
Day 1	Plant genomics & gene editing	Plant biostimulants & biocontrol	Vertical & indoor farming
Day 2	Plant bioinformatics, computational tools, & data analysis	Plant microbiome	Vertical & indoor farming

### PLANT GENOMICS & GENE EDITING

- Genome editing case studies in wheat, rice, maize, barley and soybean
- Development and application of gene editing technologies, including CRISPR/Cas9
- Plant phenotyping
- Using genome editing to improve disease resistance and stress tolerance
- Crop trait development
- Current plant gene editing regulatory guidance

### PLANT BIOINFORMATICS, COMPUTATIONAL TOOLS, & DATA ANALYSIS

- Application, analysis, and challenges of bioinformatics
- Computational tools for data modelling and visualisation
- Machine Learning and AI
- Fine Phenotyping

### PLANT BIOSTIMULANTS & BIOCONTROL

- Fulvic and humic acids
- Plant and fungal extracts
- Developing sustainable biostimulants and biopesticides
- Regulatory updates and business considerations

### PLANT MICROBIOME

- Host-pathogen interactions
- Rhizosphere, phyllosphere and endosphere biology
- Identifying microbes to enhance crop productivity & disease resistance
- Microbiome research technologies
- Plant and soil microbiome case studies

### VERTICAL & INDOOR FARMING

- Vertical & indoor farming current design and improvements
- Hydroponic and aeroponic systems
- Vertical farming case studies
- Controlled Environmental Agriculture for the future
- Hearing from start-up companies
- Advantages and limitations of vertical farming
- Utilising robotics in vertical farming

### PANEL DISCUSSION TOPICS

- Plant genomics and gene editing regulatory and policy updates
- Biostimulants and biocontrol regulatory and policy updates
- Current developments and the future of vertical farming

### PROPOSED ROUNDTABLE TOPICS

- Refining gene editing methods and applications
- Plant genomics challenges beyond technology
- The future of agriculture: Challenges and how to overcome these.
- Biostimulants and biocontrol regulatory and policy updates



**// The technologies involved are shockingly powerful and robust, so the only serious constraint to our productivity is a shortage of creativity //**

I am excited to speak at the upcoming Plant Genomics & Gene Editing Congress, held concurrent and colocal with the Partnerships in Biocontrol, Biostimulants and Microbiome Congress. Meetings such as these provide unique opportunities to share the latest advances in our understanding of plant genetics and the development of innovative agricultural solutions.

As a scientist deeply involved in studying genome components, especially their interactions, I am continually inspired by the power of modern genomic technologies. The technologies involved are shockingly powerful and robust, so the only serious constraint to our productivity is a shortage of creativity. My lab focuses on plant genome structure and evolution, and the intricate relationships between genome components and interactive gene function.

Our research encompasses a wide range of specific projects, including genetic diversity in under-utilized crops, the rapid evolution of complex disease resistance loci in plants, genome rearrangement, biomass improvement for bioenergy, and the coevolution of plant/microbe interactions. All topics we can explore together at these meetings.

During my presentation, I will share discoveries from a novel strategy we call Microbial Partner (MiPner) analysis, which uses cultured microbes as bait to identify and sequence microbial binding partners from natural environments. Our pilot experiments on soil bacteria indicate that each bait microbe selects a unique subset of soil microbes, some of which require co-growth with the bait microbe for proliferation on plates.

These meetings provide invaluable opportunities to share knowledge, foster collaborations, and explore new technologies that will drive the future of agriculture. I encourage everyone attending the meetings to ask challenging questions and be a part of all discussions.

Sincerely,

**Jeff Bennetzen**

Giles Professor, Department of Genetics, University of Georgia



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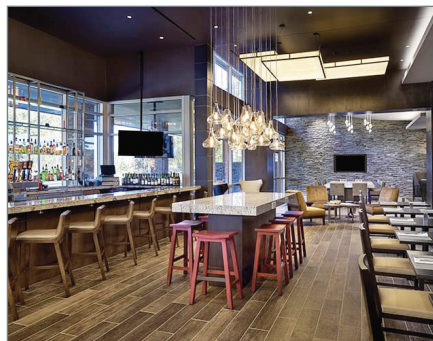
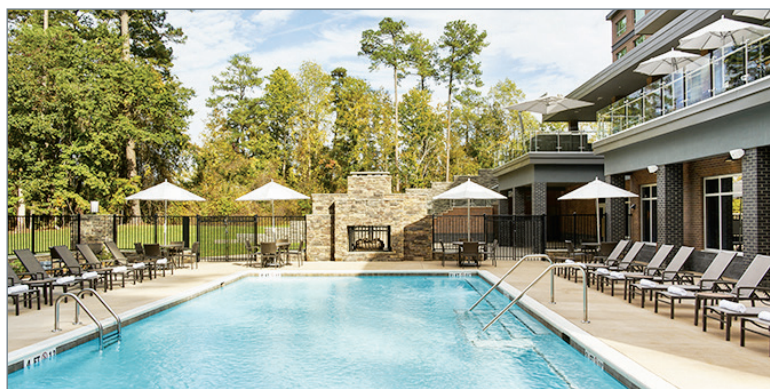
## VENUE INFORMATION

### THE STATEVIEW HOTEL

2451 Alumni Drive | Raleigh, NC 27606

[www.stateviewhotel.com](http://www.stateviewhotel.com)

Located on the Centennial Campus of North Carolina State University, the StateView Hotel offers a serene setting, modern design, and upscale service. Perfectly situated on the picturesque Lake Raleigh there are also plenty of things to do. The meeting rooms and accommodations have been thoughtfully curated with a modern design to liberate creativity and collaboration.



## CONFIRMED SPEAKERS



### WOLFGANG BUSCH

Professor and Executive Director,  
Harnessing Plants Initiative, Salk  
Institute for Biological Sciences



### ALEXANDER BUCKSCH

Associate Professor, School of Plant  
Sciences, University of Arizona



### ANDREW BENT

Professor, Department of Plant  
Pathology, University of Wisconsin-  
Madison



### CHRISTINE SHYU

Regulatory Science Genome Editing  
Enablement Lead, Bayer Crop Science



### DEEPIKA CHAUHAN

Associate Director, Transformation,  
Pairwise



### HENRY SQUIRE

PhD Candidate in Chemical &  
Biomolecular Engineering, University of  
California, Berkeley



### IAN JEPSON

Global Technology Lead, Seeds Research  
& RTP Site Business Head, Syngenta



### KEITH MATTHEWS

Principal, Matthews Law LLC



### JAMIE SAXON

Head of Sustainability, Inari Agriculture



### KIRAN MYSORE

Distinguished Professor, Oklahoma State  
University



### LISA ZANNONI

Principal, Zannoni & Associates USA



### MARC LIBAULT

Professor, Division of Plant Science  
and Technology, Interdisciplinary Plant  
Group, University of Missouri-Columbia



### MARY GRANTHAM

Technical Applications Scientist, Azenta  
Life Sciences



### NOEL SAUER

Senior Vice President of Research, Cibus



### PETER SELBY

BrAPI Project Coordinator, Cornell  
University



### RAO UPPALAPATI

Program Leader Disease Resistance  
Traits, Corteva Agrisciences



### SUBRAY HEGDE

Director, Biotechnology Risk Analysis  
Programs, APHIS USDA



### TRUPTI JOSHI

Associate Professor, University of  
Missouri-Columbia



### WUSHENG LIU

Associate Professor, Department of  
Horticultural Science, North Carolina  
State University

## CONFIRMED BIOCONTROL & MICROBIOME SPEAKERS



**JEFF BENNETZEN**  
Giles Professor, Department of Genetics, University of Georgia



**AMANDA PIERCE**  
Senior Advisor, Emerging Technologies Branch, Biopesticides Division, Environmental Protection Agency (EPA)



**CHRIS WOOLEY**  
Portfolio Manager- Specialty Actives, Wilbur-Ellis Agribusiness



**HARSH BAIS**  
Professor of Plant Biology, University of Delaware



**JANE FIFE**  
Chief Technical Officer, 3BarBiologics



**JARUI LI**  
Chief Executive Officer, Innatrix Inc



**MICHAEL DILEGGE**  
Director of Microbiology, Impello Biosciences



**MORGAN CARTER**  
Assistant Professor, Department of Biological Sciences and CIPHER, University of North Carolina at Charlotte



**PATRICK DOYLE**  
Vice President of Product Development and Regulatory, Plant Health Care Inc



**TAMARA MERAGELMAN**  
Senior Director of Research, Sound Agriculture



**WIEBKE STRIEGEL**  
Senior Scientist, Environmental Protection Agency (EPA)



**XINNIAN DONG**  
HHMI investigator/Arts & Sciences Professor of Biology, Duke University



**AKIRA ENDO**  
Senior Manager, Agri-Bio section, New Business Development Unit, Kaneka Americas Holding, Inc.



**YURI MIZUNO**  
Chief Scientist, Manda Fermentation Co. Ltd

## CONFIRMED & RESERVED VERTICAL FARMING SPEAKERS



**AZLAN ZAHID**  
Assistant Professor - Automation & AI for CEA, Department of Biological & Agricultural Engineering, Texas A&M University



**CASEY SCHWICHTENBERG**  
Senior Mechanical Engineer, AeroFarms



**CRISTIAN TOMA**  
Founder and Chief Scientific Officer, Kalera



**DAVID HARRIS**  
Director of Crop Research and Development, Freight Farms



**GUNDULA PROKSCH**  
Associate Professor, University of Washington



**HENRY SZTUL**  
Chief Science Officer, Bowery Farming



**JOHN PAUL BOUKIS**  
Head of Innovation, Square Roots Indoor Farms



**TANYA CARROLL**  
Vice President of Growing and R&D, Little Leaf Farms



**UTTARA SAMARAKOON**  
Associate Professor, Ohio State Agricultural Technical Institute, The Ohio State University



**YONG ZHU**  
Andrew A. Adams Distinguished Professor, North Carolina State University



**SENIOR REPRESENTATIVE**  
Soli Organic



**EMILY ZHOU**  
Assistant Professor, University of Central Missouri

8:00-8:50

Registration &amp; Morning Refreshments

8:50-9:00

Global Engage Welcome Address

9:00-9:35


**KEYNOTE PRESENTATION:  
WOLFGANG BUSCH**

Professor and Executive Director, Harnessing Plants Initiative, Salk Institute for Biological Sciences

**Engineering Root Traits for Climate Change Mitigation**

Climate change will soon profoundly affect human civilization. Technical solutions to address the high levels of CO<sub>2</sub> in the atmosphere at scale are absent. However, plants are central agents in the earth's carbon cycle and plant derived carbon depositions have built up three times more carbon in the soil than is contained in the atmosphere. Specific root traits are important contributors to the accumulation and permanence of carbon in the soil. These include root depth, root biomass and the levels of refractory carbon compounds in root tissues. I will present our efforts to identify genetic and molecular mechanisms that regulate these traits and to leverage genetic engineering and gene editing for enabling agriculture to contribute to massive CO<sub>2</sub> removal and climate change mitigation.

**11<sup>TH</sup> PLANT GENOMICS & GENE EDITING CONGRESS**
**PLANT GENOMICS & GENE EDITING**

9:35-10:00


**KEYNOTE PRESENTATION:  
CHRISTINE SHYU**

Regulatory Science Genome Editing Enablement,  
Lead, Bayer Crop Science

**Towards a Future-Proof Global Regulatory  
Environment for Genome Edited Products**

- Genome editing as a tool to create variation
- Current global regulatory environment and the importance of future-proof policies to enable edited product development
- A proposed fit-for-purpose approach for risk assessment of edited products

**8<sup>TH</sup> PARTNERSHIPS IN BIOCONTROL & BIOSTIMULANTS  
& MICROBIOME CONGRESS**
**PLANT BIOCONTROL & BIOSTIMULANTS**

9:35-10:00


**KEYNOTE PRESENTATION:  
PATRICK DOYLE**

Vice President of Product Development and Regulatory,  
Plant Health Care Inc

**Gazing into the crystal ball: 10 trends that will shape  
Biocontrol / Biostimulant markets**

- The future of biostimulants and biocontrol products lies in their continued development, understanding their mechanisms, and their integration into modern agricultural practices. These eco-friendly solutions are essential for addressing global challenges and ensuring food security.
- Aligned definitions within the marketplace will drive greater adoption.
  - Optimized cost of goods, clarity of mode of action, & fit with current agronomic practices will become critically important as products move from high value markets to row crops.
  - Regulatory pressures & bottlenecks will (eventually) ease when agencies move from Policy based review to Science based review.

**VERTICAL & INDOOR FARMING CONGRESS**
**VERTICAL & INDOOR FARMING**

9:35-10:00


**KEYNOTE PRESENTATION:  
CASEY SCHWICHTENBERG**

Senior Mechanical Engineer, AeroFarms

**Aeroponic Grow Systems and Optimizing Water  
Consumption and Recapture**

The indoor vertical farming industry has had many changes over the years, but a core principle that remains the same is a want to utilize the pioneering technology to decrease the usage of natural resources and offer an innovative way to grow greens. I will explore how AeroFarms' proprietary growing technology and AeroponicAdvantage™ decreases water use through aeroponics. AeroFarms' water recapture system uses up to 90 percent less water than field farming and just a fraction of the arable land in comparison to field farming. In this session, we will explore aeroponics and water consumption and recapture.

10:00-10:30

**30-Minute Solution Provider Presentation**

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10:30-11:20

Morning Refreshments / Poster Presentations / One-to-One Meetings

**PLANT GENOMICS AND GENE EDITING**

11:20-11:45


**ANDREW BENT**

Professor, Department of Plant Pathology, University of  
Wisconsin-Madison

**CRISPR and Cisgenic Strategies for Soybean  
Improvement Using Efficient WCIC Meristem-Based  
Transformation**

The UW-Madison Wisconsin Crop Innovation Center has developed an efficient, genotype-flexible meristem-based transformation system for soybean that generates a high percentage of quality events using bulk-isolated/storable meristem-containing explants. CRISPR gene edits were not initially forthcoming with this transformation system. We have now obtained sgRNA-directed mutations at high frequency using this system. Cisgenic strategies for improvement of soybean cyst nematode resistance are also being tested and initial successes will be reported.

**PLANT BIOCONTROL & BIOSTIMULANTS**

11:20-11:45


**AMANDA PIERCE**

Senior Advisor, Emerging Technologies Branch,  
Biopesticides Division, Environmental Protection  
Agency (EPA)

**EPA's regulatory framework and policy  
considerations for biocontrol**

- Explaining the regulatory landscape for biocontrol products in the United States
- Outlining the status of policy and regulatory initiatives for creating regulatory efficiencies in the path to commercialization
- Exploring EPA's future goals and vision for the regulation of biocontrol

**VERTICAL & INDOOR FARMING**

11:20-11:45


**DAVID HARRIS**

Director of Crop Research and Development,  
Freight Farms

**The Optimization Game - Vertical Farming Research  
in Today's market**

Operating a vertical farm requires a careful balance of several competing goals in order to achieve profitability. Farmers are simultaneously attempting to maximize yield, quality and flavor while minimizing labor and inputs. Modular farming relies on dynamic models that allow for flux to match the market and research in these models is crucial to achieving profitability quickly and creating conditions that allow for scale.



**KIRAN MYSORE**

Distinguished Professor, Oklahoma State University

**Improving Plant Transformation and Gene Editing Using an Engineered Agrobacterium Strain**

Agrobacterium-mediated plant transformation (AMT) is

the basis of modern-day plant biotechnology. One major drawback of this technology is the recalcitrance of many plant species/varieties to Agrobacterium infection. Two main reasons for recalcitrance to AMT are a strong plant defense response against Agrobacterium and the inability of the plant tissue to regenerate. We developed a strategy to increase AMT by engineering Agrobacterium to express a type III secretion system (T3SS) and deliver the *P. syringae* effectors to suppress host defense responses. Efforts are under way to deliver plant morphogenic regulators through the engineered Agrobacterium with T3SS to enhance plant regeneration. Efforts are also under way to deliver CRISPR-Cas9 reagents through the T3SS of engineered Agrobacterium to overcome some of the current drawbacks of plant genome engineering.

11:45-12:10

**MARY GRANTHAM**Technical Applications Scientist,  
Azenta Life Sciences**Advancing plant genomics through next generation sequencing**

Maximizing the amount of information gained from a single sample is key in understanding plant systems and plays an important role in crop genetics. Advancements in next generation sequencing technologies has increased accessibility of sequencing to researchers, with multiomics playing a larger role in plant breeding. However, within and among multiomics approaches, each methodology and application has distinct advantages and disadvantages. These can include, but are not limited to, genomics, epigenomics, and transcriptomics. Choosing the best analysis approach is dependent on overall project goals, sample types, sample quantity, resources, and time. This presentation will review multiple-omics approaches, with considerations for experimental design as standalone and integrated approaches.

12:10-12:25

**DEEPIKA CHAUHAN**Associate Director, Transformation,  
Pairwise**Enabling novel trait phenotypes through robust gene editing platform in Rubus**

Pairwise is pioneering the application of CRISPR technology in food and agriculture with a focus on food nutrition and quality, environmental adaptability, and sustainability. We are developing commercially viable products using novel technologies and our proprietary gene editing tools, like SHARC™ and REDRAW™. To drive innovation from proof of concept to product, we have developed robust rapid assays platforms for testing of gene editing tools and scalable transformation pipelines to enable large scale gene edited plant production in blackberry genotype of commercial interest. In this presentation, insights on product development pipelines, our innovative gene editing platform- the Fulcrum™ Platform and recent advances in blackberry trait phenotypes will be shared.

12:25-12:40

**JIARUI LI**

Chief Executive Officer, Innatrix Inc

**Biopesticide Platform for Sustainable Crop Protection**

The Innatrix team has built a proprietary and unique platform to rapidly develop eco-friendly biological

products to control critical crop pathogens and pests. This platform strategy identifies molecular targets in pests and pathogens that are essential for the ability of the pest or pathogen to harm crops, and then rationally designs ways of interfering with the function of those molecular targets to protect crops. The target molecules may be genes that may be silenced using double-stranded RNA (dsRNA) or may be proteins that may be rendered inactive with the use of rationally designed peptides that bind to them.

11:45-12:10

**AKIRA ENDO**Senior Manager, Agri-Bio section, New  
Business Development Unit, Kaneka  
Americas Holding, Inc.**Effective Generation of Gene Edited Crops using in planta Particle Bombardment Method**

Crop breeding using gene editing technology becomes general means in nowadays. Most of gene edited crops are produced through the conventional transformation process and it takes long time to recover isogenic mutant lines for target genes. In addition, the degree of difficulty of transformation largely depends on variety of each crop. To overcome these disadvantages, our company have developed new technology that called in planta particle bombardment (iPB). iPB is the method delivering substances directly into the shoot apical meristem (SAM) of crops. Direct delivery of gene editing tools into SAM can generate heritable mutation in some crops without tissue culture process. In addition, iPB works with lower variety dependence. We will show you that iPB is powerful technology to generate gene edited crop.

12:10-12:25

**15-Minute Solution Provider Presentation**For sponsorship opportunities contact Gavin Hambrook  
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12:25-12:40

**UTTARA SAMARAKOON**Associate Professor, Ohio State Agricultural Technical  
Institute, The Ohio State University**Nutrient optimization in hydroponic production**

For Controlled Environment Agriculture (CEA) food

crop production, cultural techniques that result in greater yield are desirable. Irrespective of the atmospheric environment, nutrient management is a key determinant of a successful hydroponic crop production. While the nutrient optimization targets for greater yield, quality parameters can often be overlooked. This presentation will explore the impact on nutrient solution on visual, nutritional, and phytochemical quality of leafy greens and provide strategies for optimization.

11:45-12:10

12:10-12:40

**30-Minute Solution Provider Presentation**For sponsorship opportunities contact Gavin Hambrook  
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12:40-1:40

Lunch / Poster Presentations / One-to-One Meetings

## PLANT GENOMICS AND GENE EDITING

## 50-MINUTE PANEL DISCUSSION:

## Plant genomics and gene editing regulatory and policy updates

**KEITH MATTHEWS** (Moderator)  
Principal, Matthews Law LLC**AMANDA PIERCE**Senior Advisor, Emerging Technologies Branch,  
Biopesticides Division, Environmental Protection  
Agency (EPA)**LISA ZANNONI**

Principal, Zannoni &amp; Associates USA

**CHRISTINE SHYU**Regulatory Science Genome Editing Enablement Lead,  
Bayer Crop Science**SUBRAY HEGDE**Director, Biotechnology Risk Analysis Programs, APHIS  
USDA**JAMIE SAXON**Head of Sustainability, Inari Agriculture  
**Improving food system sustainability using  
SEEDesign**

## PLANT BIOCONTROL &amp; BIOSTIMULANTS

POSTER FLASH  
PRESENTATIONS SESSION 1:Poster presenters and start-ups will be provided with the  
opportunity to give a flash 3-minute overview of their work.**CHRIS WOOLEY**Portfolio Manager- Specialty Actives, Wilbur-Ellis  
Agribusiness**PATRICK DOYLE**Vice President of Product Development and Regulatory,  
Plant Health Care Inc**Distribution of emerging Biocontrol / Biostimulant  
markets****YURI MIZUNO**

Chief Scientist, Manda Fermentation Co. Ltd

**Effects of Manda Fermented Botanical  
Product (MFBP) on plant and soil microbiome**

In Japan, there is an increasing recognition of the potential of biostimulant materials to enhance the intrinsic potential of crops, whilst also providing a means of mitigating the effects of environmental stress. Manda Fermented Botanical Product (MFBP) is a fermented product made by fermenting and aging 41 plant species at ambient condition for more than 3 years. Although FBP is not expected to have a generalized fertilizing effect due to the limited levels of N-P-K compositions, improvements in crop yield have been reported in foreign fields, which have been attributed to a biostimulant effects and category. This presentation will update the latest research data on the unique effects and mode of actions of FBP on plants and soil microorganisms.

## VERTICAL &amp; INDOOR FARMING

**JOHN PAUL BOUKIS**

Head of Innovation, Square Roots Indoor Farms

**Using an indoor farming platform to accelerate  
agricultural research for food and beyond**

Indoor farms often find themselves in a niche, competing against the wider world of agriculture, fighting for incremental shelf space in supermarkets. But there's a different model, where indoor farms can partner with field farmers, alongside science-focused organizations and foundations, leveraging its sophisticated technology platform to help tackle some of the biggest challenges in agriculture. This talk will highlight a number of such partnerships, from developing new crops for "food is medicine" programs reaching millions of American seniors, to "growing plants in the dark" as a food security strategy in low and middle income countries.

**GUNDULA PROKSCH**

Associate Professor, University of Washington

**Aquaponics and agricultural systems****TANYA CARROLL** (Reserved)

Vice President of Growing and R&amp;D, Little Leaf Farms

**Hydroponic Indoor Farming Case Study****30-Minute Solution Provider Presentation**For sponsorship opportunities contact Gavin Hambrook  
[gavin@globalengage.co.uk](mailto:gavin@globalengage.co.uk)

3:25-4:35

Afternoon Refreshments / Poster Presentations / One-to-One Meetings

## PLANT GENOMICS AND GENE EDITING

**IAN JEPSON**

Global Technology Lead, Seeds Research & RTP Site  
Business Head, Syngenta

**Genome editing in crop plants**

Genome editing is a powerful set of tools to discovery and optimize genes in crop plants. The technology holds the potential to improve a range of traits including drought tolerance, disease resistance, enhanced quality, improved breeding, and seed production systems. In recent years the Cas12a toolbox has been optimized both in terms of efficiency and flexibility which has allowed researchers to gain a better understanding of the molecular mechanism of important traits. In this presentation improvements in Cas12a genome engineering tools will be shared in both dicot and monocot crops. Examples from our research group of recent technical breakthroughs in corn and soybeans covering a range of traits and breeding and seed production technologies will be shared.

4:35-5:00

**30-Minute Solution Provider Presentation**

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[gavin@globalengage.co.uk](mailto:gavin@globalengage.co.uk)

5:00-5:30

**RAO UPPALAPATI**

Program Leader Disease Resistance Traits,  
Corteva Agrisciences

**Enabling Corteva's Next Generation Technologies and CRISPR-Enabled Discrete Traits**

- Corteva's CRISPR Technology and proprietary novel nucleases.
- Next generation Leaf Transformation technologies for genome editing.
- CRISPR-enabled disease super locus for managing multiple diseases.

5:30-5:55

## PLANT BIOCONTROL &amp; BIOSTIMULANTS

**JANE FIFE**

Chief Technical Officer, 3BarBiologics  
**Making an Old Microbe New Again - The Story of AzoRoot**

**The Story of AzoRoot**

- Azospirillum brasilense is a well-known plant biostimulant that promotes root development of grasses and other plant species.
- Challenges with Azospirillum products on the market have been low viability, short shelf-life, and limits on concentrations and application rates.
- A previous Azospirillum product used in turf during the 1990s called Recharge was shipped as a frozen paste and had to be used upon arrival, presenting challenges in handling, logistics, and application.
- The same Azospirillum strain used in Recharge was reimaged in a new product AzoRoot using the LiveMicrobe fermentation technology, a new packaging innovation where fresh microbes are grown on-site in the packaging.

4:35-5:00

**30-Minute Solution Provider Presentation**

For sponsorship opportunities contact Gavin Hambrook  
[gavin@globalengage.co.uk](mailto:gavin@globalengage.co.uk)

5:00-5:30

**PANEL DISCUSSION:****Biostimulants and biocontrol regulatory and policy updates****KEITH MATTHEWS (Moderator)**

Principal, Matthews Law LLC

**JANE FIFE**

Chief Technical Officer, 3BarBiologics

**WIEBKE STRIEGEL**

Senior Scientist, Environmental Protection Agency (EPA)

5:30-6:20

## VERTICAL &amp; INDOOR FARMING

**AZLAN ZAHID**

Assistant Professor, Automation & AI for CEA,  
Department of Biological & Agricultural Engineering,  
Texas A&M University

**Transforming CEA with AI-Driven Sensing and Automation**

CEA production remains expensive due to high operation costs. Nurturing crops with data could reduce production costs; however, the data is highly diverse, and growers lack the expertise to analyze this data to derive actionable insights for informed decision-making. The integration of sensing and automation technologies has emerged as a transformative toolset that can collect real-time plant data at high spatial and temporal resolutions, pivotal in optimizing resource management and maximizing production. This presentation will showcase cutting-edge sensing and automation applications within CEA, focusing on various applications including phenotyping, yield estimation, disease monitoring, spacing optimization, and harvesting. Overall, this presentation will provide insights into the transformative potential of sensing and automation in CEA, offering a glimpse into the future of data-driven and sustainable CEA production.

4:35-5:00

**30-Minute Solution Provider Presentation**

For sponsorship opportunities contact Gavin Hambrook  
[gavin@globalengage.co.uk](mailto:gavin@globalengage.co.uk)

5:00-5:30

**PANEL DISCUSSION:****Current developments and the future of vertical farming****Discussion points:**

- Current developments in vertical farming- advantages, recent advancements
- Challenges in Vertical Farming- design complexity, high energy costs
- The outlook / future of Vertical Farming

**EMILY ZHOU (Chair)**

Assistant Professor, University of Central Missouri

**JOHN PAUL BOUKIS**

Head of Innovation, Square Roots Indoor Farms

**UTTARA SAMARAKOON**

Associate Professor, Ohio State Agricultural Technical Institute, The Ohio State University

**HENRY SZTUL**

Chief Science Officer, Bowery Farming

5:30-6:20



**NOEL SAUER**

Senior Vice President of Research, Cibus

**Rapid Trait Development System™ (RTDS®) advances plant breeding techniques through an end-to-end semi-automated gene editing platform.**

- RTDS® is a suite of technologies that enables multiplexed gene editing within single cells. These edited cells are regenerated into shoots with new trait(s) such as higher yield, disease resistance or generation of sustainable ingredients.
- RTDS® has been developed in a multitude of commercially relevant crops such as canola, rice, wheat, potato, among others.
- Since all crops can be reduced to single cells, a semi-automated end-to-end gene editing production process has been deployed called the Trait Machine™. This allows for testing new trait phenotypes in customer elite germplasm in field trials within 2-3 years from project ideation.
- RTDS® has been used to develop traits such as healthier oils and higher yields in canola.

Continued

Continued

6:20

End of Day One / Networking Drinks Reception

8:00-8:50

Morning Refreshments

8:50-9:00

Global Engage Welcome Address

9:00-9:35


**KEYNOTE PRESENTATION:  
JEFF BENNETZEN**

Giles Professor, Department of Genetics, University of Georgia

**Microbial Partner (MiPner) Analysis**

Little is known about the interactions between microbes in the soil. Microbial Partner (MiPner) analysis uses one cultured soil microbe as a bait to pull out other microbes from a natural environment that binds to it. The bait-bound microbes are shotgun sequenced directly or after growth on a plate. Bait sequences are removed computationally, and the binding microbes are identified in the remainder of the sequences. Our pilot MiPner experiments show that only a small subset of total soil microbes are selected through the process, and that this binding set is unique for each bait microbe utilized. In a few cases, co-growth with the bait microbe seems to be required for plate proliferation of particular binding microbes.

9:35-10:00


**KEYNOTE PRESENTATION:  
SUBRAY HEGDE**

Director, Biotechnology Risk Analysis Programs, APHIS USDA

**USDA's Revised Biotechnology Regulations and Their Impacts on the Products Derived from Gene Editing Technologies**

- USDA responses to Regulatory Status Review requests have doubled in Fiscal Year 2024.
- USDA has proposed additional exemptions for certain modified plants.
- USDA has been working with EPA and FDA to address ambiguities, gaps, inefficiencies, and uncertainties in the Coordinated Framework as part of the Executive Order (EO 14081) on "Advancing Biomanufacturing and Biotechnology Innovation for a Sustainable, Safe, and Secure Bioeconomy"

9:35-10:00

**KEYNOTE PRESENTATION:**
**SENIOR REPRESENTATIVE** (Reserved)

Soli Organic

**Topic: The importance of crop breeding and genetics for indoor farms**

10:00-10:30

**30-Minute Solution Provider Presentation**

For sponsorship opportunities contact Gavin Hambrook  
[gavin@globalengage.co.uk](mailto:gavin@globalengage.co.uk)

10:30-11:20

Morning Refreshments / Poster Presentations / One-to-One Meetings

**11<sup>TH</sup> PLANT GENOMICS & GENE EDITING CONGRESS**
**PLANT BIOINFORMATICS, COMPUTATIONAL  
MODELLING, & DATA ANALYSIS**

11:20-11:45


**MARC LIBAULT**

Professor, Division of Plant Science and Technology, Interdisciplinary Plant Group, University of Missouri-Columbia

**Towards a system-level understanding of soybean-rhizobia symbiosis at the single cell level**

Each plant cell is characterized by its specific function, developmental stage, and interaction with its environment. In this presentation, focusing on the symbiotic interaction between soybean plants and Bradyrhizobium diazoefficiens, nitrogen-fixing symbiotic bacteria we will present the use of single-cell omics and high-resolution spatial transcriptomics to 1) characterize the cellular complexity of the infection zone of the soybean nodule and reveal a similar cellular composition but different organization between different type of nodules, and 2) depict the role of the sub-cellular compartmentalization of plant transcripts as a regulatory mechanism of protein translation.

**8<sup>TH</sup> PARTNERSHIPS IN BIOCONTROL & BIOSTIMULANTS  
& MICROBIOME CONGRESS**
**PLANT MICROBIOME**

11:20-11:45


**MORGAN CARTER**

Assistant Professor, Department of Biological Sciences and CIPHER, University of North Carolina at Charlotte

**Towards using endofungal bacteria to investigate and control plant pathogens**

As we further catalog plant microbiomes, a greater understanding of the interactions present within those spaces is critical. Microbiomes within microbes themselves introduce both a complication and a valuable resource. Fungi can harbor endosymbiotic bacteria that alter their ability to reproduce, their primary and secondary metabolism, and ultimately their interaction with a plant host. Though endofungal bacteria are likely a common phenomenon, little is known about how, when, where, and why they occur. We are screening plant pathogenic fungi for endofungal bacteria and assessing their impact on plant health. In parallel we are focusing on representative partnerships to interrogate the mechanisms underlying these changes and selectivity. In sum, we aim to use endofungal bacteria to both investigate and control important fungal pathogens.

**VERTICAL & INDOOR FARMING CONGRESS**
**VERTICAL & INDOOR FARMING**

11:20-11:45

**CRISTIAN TOMA**

Founder and Chief Scientific Officer, Kalera

**Circular Controlled Environment Agriculture Systems**



11:45-12:15

**30-Minute Solution Provider Presentation**

For sponsorship opportunities contact Gavin Hambrook  
[gavin@globalengage.co.uk](mailto:gavin@globalengage.co.uk)

**ALEXANDER BUCKSCH**

Associate Professor, School of Plant Sciences,  
 University of Arizona

**Root phenotyping reveals new functional and genetic insights from the population to the cell level**

A plant's history can often be inferred from its shape phenotype. This is especially evident in roots, which demonstrate significant plastic responses to changing environmental conditions during development. Computational techniques to organize the complex shape signals detected by sensors enable the identification of simple and understandable rules governing the formation root phenotypes. Coming from a mathematical shape perspective we will delve into the function of natural variation in root architectures and explore shape diversity and function of epidermal appendages in roots.

12:15-12:40

**EARLY CAREER RESEARCHER PRESENTATION: HENRY SQUIRE**

PhD Candidate in Chemical & Biomolecular  
 Engineering, University of California, Berkeley

**Plant derived cell-penetrating peptides deliver protein cargoes for plant bioengineering**

Direct delivery of proteins could enable novel DNA-free approaches to plant bioengineering. However, a protein delivery tool capable of delivering cargoes with high efficiency to a breadth of plant species is missing from the plant biotechnology tool kit. Cell-penetrating peptides (CPPs) are a class of delivery tool capable of delivering cargoes to mammalian cells for therapeutic applications. While CPPs are well studied in animal systems, investigation of CPPs in plants are scant. Utilizing a recently reported screening methodology termed delivered complementation in planta, we present a new class of CPPs derived from plant homeodomain proteins with over 30% internalization efficiency to plant cells. We probe the mechanism of internalization, computationally explore the homeodomain CPP design space, and demonstrate delivery of recombinant transcription factors and recombinases.

12:40-1:05

11:45-12:15

**30-Minute Solution Provider Presentation**

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**JIA RUI LI**

Chief Executive Officer, Innatrix Inc

**CROSS-EVENT ROUNDTABLE DISCUSSIONS:****Table 1: Challenges for biopesticide product commercialization**

- How to ensure low COGs for biological product manufacturing?
- Global registration of biopesticide
- How do startups work with big biotech firms and distributors?

**Proposed roundtable topics:**

- Refining gene editing methods and applications
- Plant genomics challenges beyond technology
- The future of agriculture: Challenges and how to overcome these.
- Biostimulant and biocontrol regulation

12:15-1:05

11:45-12:15

**30-Minute Solution Provider Presentation**

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12:15-1:05

**POSTER FLASH****PRESENTATIONS SESSION 2:**

Poster presenters and start-ups will be provided with the opportunity to give a flash 3-minute overview of their work.

1:05-2:05

Lunch / One-to-One Meetings

PLANT BIOINFORMATICS, COMPUTATIONAL  
MODELLING, & DATA ANALYSIS**TRUPTI JOSHI**

Associate Professor, University of Missouri-Columbia  
**Translational Bioinformatics Resources and AI Solutions for Multiomics Research**

Next generation sequencing and multiomics data (bulk and single-cell) capturing molecular changes from genomics all the way to phenomics, have become an integral part of research in all domains including biomedical sciences, plants sciences, and others. This rapid revolution in the multiomics has posed a growing need for translational tools that can handle large amounts of data, are easily expandable, provide interpretable results and can be readily applied to any species. To address such translational needs, we have developed Soybean Knowledge Base (SoyKB) and Knowledge Base Commons (KBCommons) web-based frameworks, both fully equipped to handle the entire multiomics landscape for all organisms. Our developed tools such as Allele Catalog, GenVarX, AccuTool, and MaDis, are specifically designed to provide the plant community with efficient data driven solutions for better breeding strategies. Additionally, our G2PDeep, deep learning method, provides a comprehensive web-based resource for phenotype predictions using multiomics data for all organisms.

2:05-2:30

**PETER SELBY**

BrAPI Project Coordinator, Cornell University  
**Applications and impacts of the BrAPI project on breeding and genetic resources**

Modern genomic breeding methods rely heavily on large, complex, phenotypic and genotypic data sets, often stored on multiple systems, sometimes separated by organization and country. As the common analyses methods increasingly require aggregation of datasets from diverse sources, data exchange between disparate systems becomes a challenge. The Breeding API (BrAPI) Project began in 2014 when a small group of breeding and technology experts came together to try to standardize their data. Since then, BrAPI has become internationally accepted as one of the primary data exchange standards in the breeding domain. This talk will give an overview of what BrAPI is, how it works, what it is capable of, and the impact the project has had so far on the community.

2:30-2:55

**WUSHENG LIU**

Associate Professor, Department of Horticultural Science, North Carolina State University  
**Identification of Plant Constitutive Promoter Motifs via De Novo Promoter Motif Discovery**

Limited constitutive promoter motifs of plant origin are available for use in driving constitutive transgene expression in plants. We recently identified a set of constitutive promoter motifs from soybean, which were 19 ~ 60 bp in length and drove strong GUS reporter gene expression in agroinfiltrated tobacco leaves and strong constitutive GUS expression in stable transgenic Arabidopsis seedlings. These promoter motifs are of plant origin, novel, short in length, and can drive constitutive gene expression in dicot species.

2:55-3:20

**SENIOR REPRESENTATIVE**

Invitation Out

3:20-3:45

## PLANT MICROBIOME

**TAMARA MERAGELMAN**

Senior Director of Research, Sound Agriculture  
**Sound Agriculture: Sustainability Powered by Science**

At Sound Agriculture, we established a biochemistry platform to design and develop molecules capable of controlling complex systems of interconnected biological networks. One successful example of the implementation of our platform is our flagship product, SOURCE. This product was designed to enhance plant nutrient use efficiency through selective signaling with specific beneficial soil microbes, including nitrogen fixers, phosphorus solubilizers, and AMF. The foliar application of this product in the field provides a unique tool to growers, reducing up to 25 lbs/acre of synthetic fertilizers, mitigating the environmental impact while driving a resilient agriculture system.

2:05-2:30

**MICHAEL DILEGGE**

Director of Microbiology, Impello Biosciences  
**Co-culturing fermentation: A Continuum of Microbial Ecology insights**

- Describe the historical movement toward monoculturing microbial species, examples of microbial monocultures readily used/available in a few industries.
- Introduce the co-culture concept, microbe-microbe interaction importance, effects toward the plant / host.
- Synergy in bringing these products to the agricultural industry and future insights.

2:30-2:55

**XINNIAN DONG**

HHMI investigator/Arts & Sciences Professor of Biology, Duke University

**Engineering broad-spectrum disease resistance in plants**

In plants, a local infection can trigger long-lasting systemic acquired resistance (SAR) against a broad spectrum of pathogens. During my lecture, I will present our recent advancements in understanding the structure and function of NPR1, a key regulator of SAR, as well as our discoveries of highly conserved translation regulatory modules for reprogramming the defense proteome. I will demonstrate how this new knowledge may lead to new strategies for controlling crop diseases in agriculture.

2:55-3:20

**HARSH BAIS**

Professor of Plant Biology, University of Delaware  
**Plant microbiome case study**

3:20-3:45

## VERTICAL &amp; INDOOR FARMING

**EMILY ZHOU**

Assistant Professor, University of Central Missouri  
**Advantage and limitations of vertical farming**

- Advantages of vertical farming
- Limitations and challenges of vertical farming
- The future of vertical farming

2:05-2:30

**YONG ZHU**

Andrew A. Adams Distinguished Professor, North Carolina State University

**Plant wearable sensors for detecting biotic and abiotic stresses**

We report a multimodal wearable sensor for continuous monitoring of plant physiology by tracking both biochemical and biophysical signals of the plant and its microenvironment. Sensors for detecting volatile organic compounds (VOCs), temperature, and humidity are integrated into a single platform.

2:30-2:55

**MEGAN GAMBRILL (Reserved)**

**Topic: Successful translation from R&D to production in indoor farming**

2:55-3:20

**SENIOR REPRESENTATIVE**

Invitation Out

3:20-3:45

### FREE POSTER PRESENTATIONS AND FLASH TALKS

Whether looking for funding, employment opportunities or simply wanting to share your work with a like-minded and focused group, these are an excellent way to join the heart of this congress. In order to present a poster at the forum, you need to be registered as a delegate. Please note that there is limited space available and poster space is assigned on a first-come-first-served basis (subject to checks and successful registration).

Poster presentations are actively encouraged at this event and as such registered academic and industry delegates are invited to present 1 poster each for free.

- Posters are displayed for the full two days of the event.
- We have reserved 2 x 50 minute sessions for non-vendor authors to present a flash presentation of their poster in order to showcase their work.
- We also issue a poster eBook to all attendees containing your full abstract, and you can share your poster as a PDF after the meeting if you desire (optional).

#### MAKING A POSTER PRESENTATION

We will require the form Downloadable [Here](#) to be submitted by 4<sup>th</sup> October 2024.

## SUSTAINABILITY GOALS

### SUSTAINABILITY

#### Venues with Sustainability Goals

We are committed to selecting venues with more sustainable practices. These will cover energy supply, food & waste, water use, recycling and plastics.

#### Catering

You will have some great food choices while you are with us. We have worked with the caterer to increase the proportion of plant-based items. We have also built a plan with the venue to avoid waste through how they serve meals and how any leftovers are processed. Our aim is that you have some great meals, whilst with us, but with less environmental impact by the time you leave.

#### Travel

An international meeting does involve travel but where it is practical, please consider more sustainable alternatives to flying. The app will also have a discussion space to arrange ride shares.

