

# 2020 SOYBEAN BREEDERS WORKSHOP

## - *Plant Physiology and Agronomy*

**March 2-4<sup>th</sup>, 2020**

**Sheraton Westport Chalet Hotel, 191 Westport Plaza Dr., St. Louis, MO**

## Registration in Versailles Foyer

**Monday, Mar 2<sup>nd</sup>                    10:30 a.m. – 5:00 p.m.**

**Tuesday, Mar 3<sup>rd</sup>                    7:00 a.m. – 5:00 p.m.**

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### **Monday, March 2, 2020 | Room: Versailles 1**

**Session 1: Breeding and Breeding Innovation | Chair: Zenglu Li, University of Georgia**

- 1:00 p.m. **Thomas Carter Jr., USDA-ARS: The future of drought tolerance breeding in soybean**
- 1:30 p.m. **Michelle Graham, Danny Singh and Jamie O'Rourke, USDA-ARS and Iowa State Univ.: Studying IDC in soybean: a model revolution for crop stress adaptation**
- 2:00 p.m. **Martin Mariani Ventura, Verdeca: Environmental resilience in soybean**
- 2:30 p.m. **Landon Ries, Corteva Agriscience, Remote sensing in soybean breeding at Corteva**

**3:00 - 3:20 p.m. Coffee Break | Foyer**

**Session 2: Breeding and Breeding Innovation | Chair: Rouf Mian, USDA-ARS**

- 3:20 p.m. **Neil Yu, Bayer CropScience: Soybean breeding innovation at Bayer**
- 3:50 p.m. **Henry Nguyen, University of Missouri: Soybean genomic resources and genomics-assisted approach to improving drought tolerance**
- 4:20 p.m. **Timothy Venverloh, VP of the United Soybean Board: USB update**

**5:00 - 6:00 p.m. Poster session | Versailles 2**

### **Tuesday, March 3, 2020 | Room: Versailles 1**

**Continental Breakfast | 7:00 - 8:00 am | Versailles Foyer  
Hosted by the Commercial Soybean Breeders**

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**Session 3: Abiotic Stress - Drought | Chair: Larry Purcell, University of Arkansas**

- 8:00 a.m. **Anna Locke, USDA-ARS:** Examining slow-wilting physiology in the field
- 8:25 a.m. **Ford Denison, University of Minnesota:** Breeding to enhance nitrogen and other benefits from rhizobia
- 8:50 a.m. **Walid Sadok, University of Minnesota:** Physiological phenotyping of water-saving traits in soybean
- 9:15 a.m. **Larry Purcell, University of Arkansas:** Identification of drought tolerant alleles and genotypes using association mapping

#### 9:45 - 10:15 a.m. Coffee Break | Foyer

#### Session 4: Abiotic Stresses other than Drought | Chair: Anna Locke, USDA-ARS

- 10:15 a.m. **Kent Burkey, USDA-ARS:** Improving the ozone tolerance of soybean – next chapter in the Fiskeby story
- 10:45 a.m. **Jason Gillman, USDA-ARS:** Multidisciplinary studies on exotic germplasm resistant to heat-induced seed degradation
- 11:10 a.m. **Courtney Leisner, Auburn University:** Physiological and transcriptomic responses to abiotic stress in the soybean seed coat
- 11:35 a.m. **Heng Ye, University of Missouri:** Genetic diversity, molecular and physiological mechanisms, and breeding for flooding tolerance in soybean

#### 12:00 - 1:00 p.m. Lunch

#### Session 5: Production Management | Chair: Seth Naeve, University of Minnesota

- 1:00 p.m. **Seth Naeve, University of Minnesota:** Variation in soybean composition by environment (mostly)
- 1:30 p.m. **Patricio Grassini, University of Nebraska-Lincoln:** Accelerating yield gains through analysis of producer data
- 1:55 p.m. **Ignacio Ciampitti, Kansas State University:** N fixation and shifts in soybean seed composition
- 2:20 p.m. **Jeremy Ross, University of Arkansas:** Herbicide technologies in soybean: from the perspective of a southern agronomist

#### 2:45 - 3:15 p.m. Coffee Break | Foyer

#### Session 6: High-throughput Phenotyping | Chair: Aaron Lorenz, University of Minnesota

- 3:15 p.m. **Katy Rainey, Purdue University:** Scalable and effective phenotyping of longitudinal and physiological traits for soybean improvement
- 3:40 p.m. **Danny Singh, Iowa State University:** Developing innovations for advancing breeding outcomes
- 4:05 p.m. **Milad Eskandari, University of Guelph:** New tools to improve genetic gain in plant breeding: high throughput phenotyping combined with machine learning

- 4:30 p.m. **Austin Dobbels, University of Minnesota:** UAS-based phenotyping of iron deficiency chlorosis tolerance and physiological maturity for soybean breeding

**5:00 - 6:30 p.m. Social Hour & Poster Session | Foyer & Versailles 2**

## **Wednesday, March 4, 2020 | Room: Versailles 1**

**Continental Breakfast | 7:00 - 8:00 a.m. | Versailles Foyer  
Hosted by the Commercial Soybean Breeders**

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**Session 7: Reports and announcement | Chair: Zenglu Li, University of Georgia**

- 8:00 a.m. **Luciano Jaureguy, Corteva Agriscience:** Announcement of poster winners
- 8:10 a.m. **Michelle Graham, USDA-ARS:** SoyGEC Report
- 8:25 a.m. **Rex Nelson, USDA-ARS:** Soybean Genetics Committee report and SoyBase.org update
- 8:55 a.m. **Dechun Wang, Michigan State Univ.:** Soybean Germplasm Committee report
- 9:10 a.m. **From the floor:** Recognitions, retirements, and announcements

**Session 8: Breeding, Genetics, and Seed Composition | Chair: David Walker, USDA-ARS**

- 9:30 a.m. **Bo Shen, Corteva Agriscience:** Discovery of four high oil genes and development of next generation soybean output traits
- 10:00 a.m. **Khalid Meksem, Southern Illinois University:** Applications of TILLING by Exom Sequencing to improve soybean seed oil and protein
- 10:30 a.m. **Charles An, USDA-ARS:** Application of a big-data driven technology platform to discover soybean trait genes, beneficial alleles and germplasm for seed quality improvement

**11:00 a.m. Adjourn**

## **Technicians' Workshop**

**Date and time:** 1:00 p.m., March 2<sup>nd</sup> - 5:00 p.m., March 4<sup>th</sup>, 2020

**Organizer:** Troy Cary

**Room:** St. Moritz / Bern

# **Soybean Seed Composition Workshop**

**Date and time:** 1:30 p.m., March 4<sup>nd</sup> - 12:00 p.m., March 5<sup>th</sup>, 2020

**Organizer:** Lisa Weaver

**Room:** Matterhorn

## **Wednesday, March 4, 2020 1:30 pm – 5:00 pm**

1:30 – 1:45 Welcome

1:45 – 2:30 **Modifying Soluble Carbohydrates in Soybean Seed for Enhanced Nutritional Energy Meal**  
Katy Martin Rainey, associate professor, Agronomy, Purdue University

2:30 – 3:15 **High Oleic and Low Linolenic Soybean Variety Development**  
Andrew Scaboo, assistant professor, Plant Sciences, University of Missouri

### **3:15 – 3:30 break**

3:30 – 4:15 **Developing High-Yielding Cultivars and Germplasm with Optimum Oil and Protein Content, and Innovative Oil Attributes for the Current Soybean Market**  
Leah McHale, associate professor, Horticulture & Crop Science, the Ohio State University

4:15 – 5:00 **The Broiler Vertical Integrated Supply Chain: Soybean Use and Opportunities**  
Michael Kidd, professor, Poultry Nutrition, University of Arkansas

## **Thursday, March 5, 2020 8:00 am – 12:00 pm**

8:00 – 8:15 Welcome

8:15 - 9:00 **Increasing Genetic Diversity, Yield, and Protein of US Commercial Soybean Germplasm**  
Brian Diers, professor, Crop Sciences, University of Illinois; Aaron Lorenz, associate professor, Agronomy and Plant Genetics, University of Minnesota

9:00 - 9:45 **Development of High Yielding High Oleic/Ultra-Low Linolenic Acid Soybean Varieties That Have 1-3% Protein Above Commodity Soybeans and Represent Relative Maturities of 1 to 5**  
Bill Rhodes, director, R&D and Kevin Cook, senior director, R&D, Benson Hill

### **9:45 - 10:00 Break**

10:00 –10:45 **Integrative Modeling and Visualization for the Development of in Silico Crops**

Amy Marshall-Colon, assistant professor, Plant Biology, University of Illinois

10:45 - 11:30 **Discover Sources, Genes, and Develop New Varieties and Germplasm with Improved Meal Protein Utilizing Diversity in Cultivated and Wild Soybeans**

Rouf Mian, research geneticist, USDA, Soybean and Nitrogen Fixation Unit, NC

*Closing remarks and wrap up*

## Special Meetings

<i>Date &amp; Time</i>	<i>Meeting</i>	<i>Contact person</i>	<i>Room</i>
<b>Sun, Mar 1<sup>st</sup></b>			
1:00 pm - 6:00 pm	USB project meeting	Zenglu Li	Alpine I
<b>Mon, Mar 2<sup>nd</sup></b>			
8:00 am - 12:00 pm	Genomic Prediction/ Selection Workshop	Aaron Lorenz	St. Moritz/ Bern
8:30 am -10:00 am	SoyBase Workshop Meeting	Rex Nelson	Alpine II
8:30 am -10:00 am	Soybean Germplasm Committee Meeting	Dechun Wang	Alpine I
10:00 am - 12:00 pm	Soybean Genomics Executive Committee	Michelle Graham	Alpine I
1:00 pm - 5:00 pm	Technicians' Workshop	Troy Cary	St. Moritz/ Bern
5:30 pm - 6:30 pm	Commercial Soybean Breeders' Business Meeting	Luciano Jaureguy	Alpine I
7:00 pm - 8:00 pm	Soybean Genetics Committee	David Grant/Rex Nelson	Alpine II
<b>Tue, Mar 3<sup>rd</sup></b>			
8:00 am - 12:00 pm	Technicians' Workshop	Troy Cary	St. Moritz/ Bern
7:00 pm - 8:00 pm	Uniform Regional Testing - South	Anne Gillen	Alpine I

7:00 pm - 7:30 pm	Uniform Regional Testing - North	Gary L Nowling/ Guohong Cai	Alpine II
7:30 pm - 8:00 pm	SCN Regional Testing	Brian Diers	Alpine II

### **Wed, Mar 4<sup>th</sup>**

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7:00 am - 8:00 am	Public-Private Southern Breeders Meeting	Tommy Carter	St. Moritz/ Bern
11:00 am - 6:00 pm	USB Seed Composition Workshop	Lisa Weaver	Matterhorn

### **Thu, Mar 5<sup>th</sup>**

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8:00 am - 12:00 pm	USB Seed Composition Workshop	Lisa Weaver	Matterhorn
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## **Workshop Organizers**

**Zenglu Li**, University of Georgia, Athens, GA

**Rouf Mian**, USDA-ARS, Raleigh, NC

**Larry Purcell**, University of Arkansas, Fayetteville, AR

**Anna Locke**, USDA-ARS, Raleigh, NC

**Seth Naeve**, University of Minnesota, Minneapolis, MN

**Aaron Lorenz**, University of Minnesota, Minneapolis, MN

**David Walker**, USDA-ARS, Urbana, IL

**Rex Nelson**, USDA-ARS, Ames, IA

### **Executive Board of Commercial Soybean Breeders**

**Luciano Jaureguy**, Corteva Agriscience

**Keith Merrill**, Bayer CropScience

**Clint Steketee**, Inari

**Heinrich Wohleser**, Bayer CropScience

**Raymond Kennett**, BASF

**Clem Weidenbenner** (advisor), KG AgriProducts

## *Acknowledgement*

*Special thanks to our sponsors, **United Soybean Board, Bayer CropScience, and Corteva Agriscience***



**Bayer CropScience**

