

NC1212: Exploring the Plant Phenome in Controlled and Field Environments

NC-1212 Annual Meeting Minutes
9 Feb 2026, Kellogg Hotel and Conference Center
Michigan State University, East Lansing, MI

Meeting Lead and Coordinator: Addie Thompson

Agenda:

- 1 pm – Opening / intro, description of NC1212
Short state rep update presentations (5 min max per site)
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|--------------------------|----------------|
| Addie Thompson | Michigan |
| Tala Awada | Nebraska |
| Yin Bao | Delaware |
| Peng Fu | Louisiana |
| Carmela Rosaria Guadagno | Wyoming |
| Cory Hirsch | Minnesota |
| Katie Murphy | DDPSC |
| Erin Sparks | Missouri |
| Ravi Mural | South Dakota |
| Michael Kudenov | North Carolina |
| Yang Yang | Indiana |
| Sam Revolinski | Kentucky |
- 2 pm – External invited team talk
Ana Heilman, Matheus Souza, Madhurjo Das Aishy – NDSU
- 2:30 pm – 15min break
- 2:45 pm – Invited local speakers
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|--------------|---------------------------|
| Miranda Haus | Michigan State University |
| Eric Olson | Michigan State University |
- 3:00 pm – Highlighted NC1212 member presentations
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|-------------------|-----------------------------|
| Alex Bucksch | Arizona |
| Sindhuja Sankaran | Washington State University |
- 3:30 pm – Group project discussions and planning
- 4:30 pm – Business meeting and elections
- 5:00 pm – Dismiss for conference evening events

Participants:

Addie Thompson – Michigan State University
Alex Bucksch – University of Arizona
Ana Heilman-Morales – North Dakota State University
Carmela Guadagno – University of Wyoming
Cory Hirsch – University of Minnesota
Eric Olsen – Michigan State University
Erin Sparks – University of Missouri

Frank Bai – North Carolina State University
Gabby Berger – Washington State University
Jagjeep Singh Sidhu – University of Missouri
Jennifer Clarke – University of Nebraska Lincoln
Katie Murphy – Donald Danforth Plant Science Center
Lourdes Lopez – Michigan State University
Luke Gregory – Cornell University
Madhurjo Aishy – North Dakota State University
Mathhew Souza – North Dakota State University
Michael Kudenov – North Carolina State University
Miranda Haus – Michigan State University
Pappu Yadav – South Dakota State University
Peng Fu – Louisiana State University
Puranjoy Sar – University of Wisconsin Madison
Raju Thada Magar
Sindhuja Sankaran – Washington State University
Tala Awada– University of Nebraska Lincoln
Tarandeep Singh – Michigan State University
Trey Garson – Bayer Crop Science
Yahya Rauf – Texas A&M AgriLife Research
Yang Yang – Purdue University
Yin Bao – University of Delaware
Yufeng Ge – University of Nebraska Lincoln
Zaki Jubery – Iowa State University

Words from Advisor, Tala Awada: NIFA Programs NOFO: [AFRI Strengthening Agricultural Systems](#), [AFRI Education and Workforce Development](#)

State Summaries:

Michigan: Details on research and facilities will be learnt through 2026 NAPPN Annual Conference.

Nebraska: Three major facilities: Greenhouse Innovation Center (NIC), Spidercam Field Phenotyping Facility, LemnaTec HTS (Beadle Center).

Different projects – including abiotic and biotic stress monitoring – environmental pollutants and heavy metal included.

Delaware: Different projects include blueberry yield prediction (using App developed for Android and iOS), lima bean pod counting ($R^2 = 0.917$), and maize water logging response evaluation.

Louisiana: Phenomics for plant breeding efforts (sugarcane, rice, sweet potato, wheat, and oats), LiDAR based stem count and biomass, and contributions to Global Spectral Trait Initiative (GSTI).

Wyoming: Plant Growth and Phenotyping Facility – hydroponic, growth chamber, vertical tower; Center for Controlled Environment Agriculture; TRI-CEA (Tri-State Controlled Environment Agriculture) EPScoR funds with NM and SD, Ongoing REU Program, PCL grant submitted, Wyoming Innovation Partnership, CEA Network and other activities.

DDPSC: Phenotyping Core Facility Mission, 14+ Start-Ups, Service providers – Equipment rental, Training and workshops, and Full-service experiments. Summary about PlantCV, Other projects – e.g. Maize Abiotic Stress Detection – CEA, field (with rain out shelters), and metabolic profiling (other partners include Noah Falgren, Malia Gehan, Nadia Shakoor, Erin Sparks, Ivan Baxter).

Missouri: Biomechanics - Working on corn and sorghum – root lodging and anchorage; root biology; Maize and wheat phenotyping; Crop physiology – installment of 200 mini lysimeters; computation and vision for developing imaging pipelines and predictive phenotyping; and the presence of Digital Ag Research and Extension Center.

Kentucky: Herbicide damage phenotyping and abiotic stress monitoring, Tall fescue abundance estimation through RGB images and development of app-based applications.

South Dakota: Phenomics for corn, sorghum, wheat breeding – Bacterial leaf streak in spring wheat; Implementation of machine vision; Implementation of AI and Robotics for biomass estimation in soybean.

North Carolina: 18 research stations and 5 animal (feedmill) farms – Phenotyping for plant production to animal feed; Ongoing collaborations with UNL – crop water use efficiencies; Collaborative efforts on grants with UNL, Delaware among others; Working towards evaluating sweet potato quality.

Indiana: New greenhouse facility; Use of X-ray CT for wheat pinnacle evaluation, corn lead segmentation; UAV services and Industry collections (Corteva, Bayer, Amazon, Barlett, etc.).

Invited Talk: North Dakota State University: Ag Data Analytics Team: Ana Heilman, Matheus Souza, Madhurjo Das Aishy

<https://sites.google.com/ndsu.edu/plsc-bpdm/projects?authuser=0>
<https://ndsu.shinyapps.io/fieldhub/>

Description and demo of platform/tool to automatically analyze the UAV data with user-friendly GUI.

Invited Talk: Miranda Haus — Michigan State University

Evaluation root disease (Fusarium root rot in dry bean) using image analysis with PlantCV.

Invited Talk: Eric Olson — Michigan State University

Evaluating canopy architecture and tillering using RGB and multispectral imaging using UAV and integrating phenomics data for genomics prediction in wheat.

Using RGB, multispectral, hyperspectral, and thermal sensing to assess microtoxins, Fusarium late blight, Stripe rust in Wheat and identifying SNPs.

Invited Talk: Alex Bucksch — University of Arizona

Root phenotyping – hooked hairs in dry bean – with stable shape and stress response; Maricopa – High clearance tractors, cart, and robotic field scanners; ongoing work in lettuce, cotton, maize, sorghum, and common bean; root 3D scanner.

Invited Talk: Sindhuja Sankaran — Washington State University

IoT research – time series analysis of data; integrating phenomics and crop modeling; software tools developed by Zhang Lab; integration of phenomics in Carter and Pumphrey Labs; phenomics facilities at WSU and USDA-ARS Labs; Importance of investments to support phenomics facilities.

Potential Topics for Future Collaborations:

- AFRI Education and Workforce Development – REEU & Community College Engagement – Short Turnaround
- AFRI Strengthening Agricultural Systems – Michael Kudenov leading one in collaboration with other institutes.
- Consortium Shared Community – Expertise & Network of infrastructure
 - NAPPN/IPPN Working Groups
 - Development of Business Models to sustain phenomics infrastructure
 - Development of “Cloud Lab” for data analysis (Carmela Rosaria Guadagno) – one submitted in December 2025
 - Workforce Development (Katie Murphy)
- Potential projects around
 - Maintenance and support for phenomics technology/hardware
 - Workforce development – Phenomics technician – Certificate program
- Tala Awada’s office will facilitate scheduling monthly meeting

Elections: Carmela (Lina) Rosaria Guadagno is appointed as upcoming Vice Chair (2026-2027) and Chair (2027-2028).