

the
Genomes  **F**ields
to initiative

G2F 2019 Data Update

Alejandro Castro & Bridget A. McFarland
2019 Collaborator Meeting, December

Overview

- New Research Coordinator Introduction
- Recap of 2019 Field Season
- 2019 Data Update
- 2014- 2017 DOIs, 2018 ARK Progress
- Data Release Timeline
- Reminders

New
Coordinator

2019 Recap

2019 Data

DOI/ ARK
Progress

Data Release
Timeline

Reminders

Alejandro Castro



- B.S. Agronomy – Zamorano University (Honduras)

- M.S. Plant Breeding - LSU
- Ph.D. Plant Breeding – LSU



SunGrains Breeding Cooperative



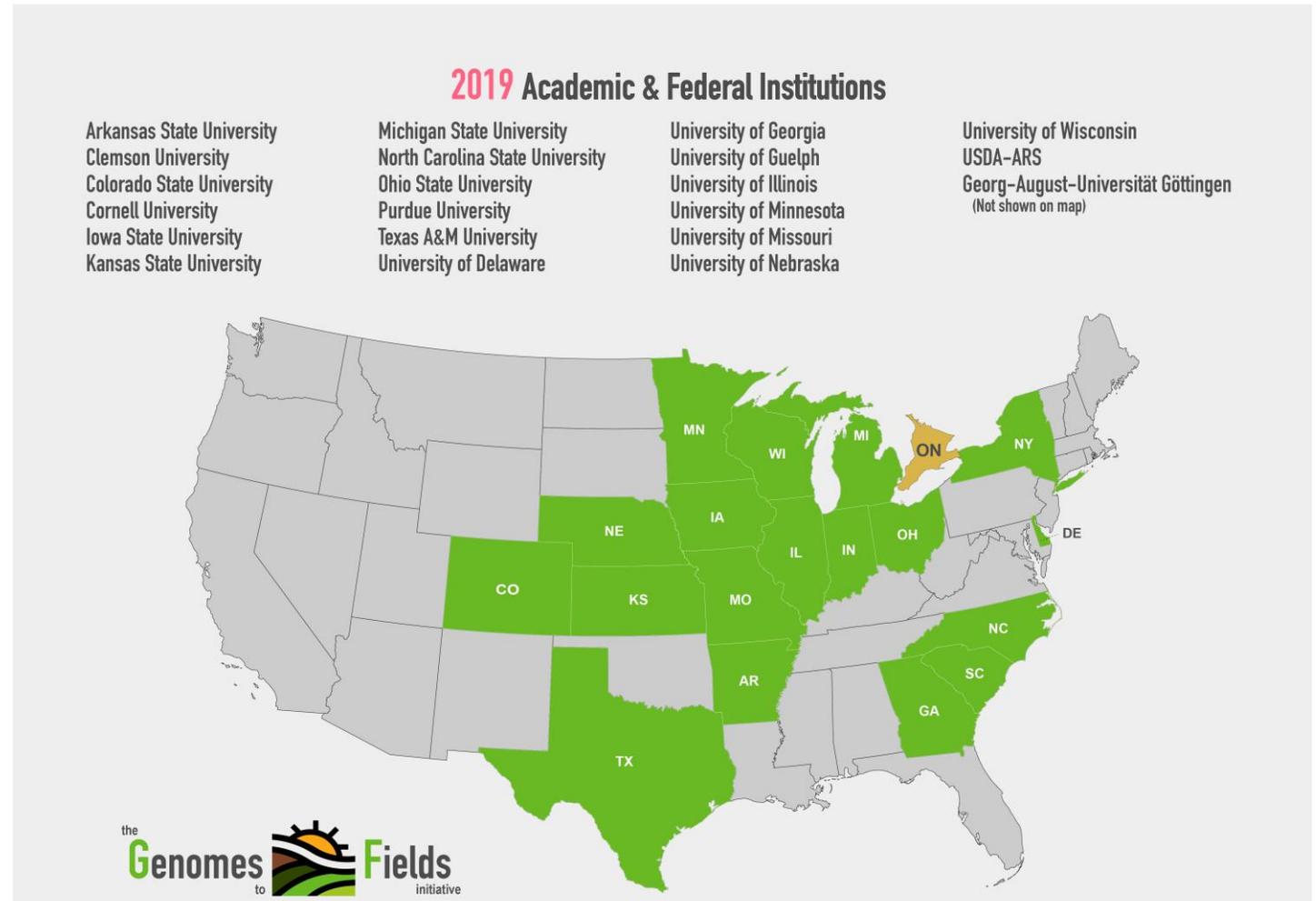
Overview of G2F

- **Overall GxE project goal:** improve phenomic predictability and facilitate the development and deployment of tools and resources that help address fundamental problems of sustainable agricultural productivity.

	2014	2015	2016	2017	2018	2019
No. of unique locations	42	52	30	32	27	35
No. of plots planted	12,679	17,350	16,480	21,252	27,298	27,291
No. of plots post-harvest and data cleaning	12,302	11,956	16,014	15,940	24,379	TBD

Overview of 2019

- 21 Academic and Federal Institutions
- 30 PIs
- 35 unique locations

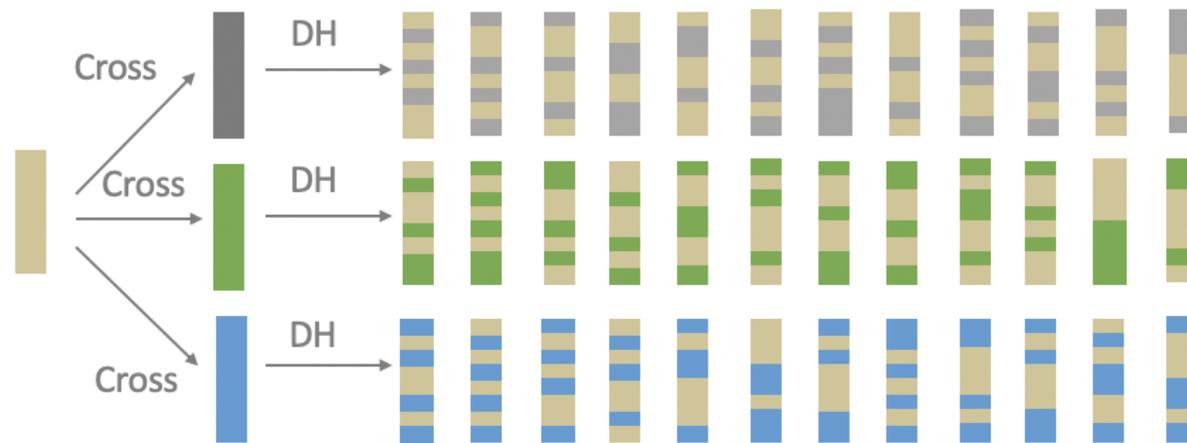


Data Collection

- Phenotypic
 - Plot-level notes of stand count, lodging, flowering, yield, etc. (*n= 15*)
- Genotypic
 - 2014 – 2017 Genotyping by Sequencing (GBS), all lifted to B73v4 (*n= 1577*)
 - 2018 – 2019 Practical Haplotype Graph (PHG)
- Climatic
 - Field-level from weather stations temperature, relative humidity, rainfall, wind, PAR (new this year!), soil temp, photoperiod, etc. (*n=14*)
- Soil
 - Field-level soil samples for pH, OM%, CEC, ppm of K/S/Ca/Na, %sand/silt/clay, texture, etc. (*n=24*)
- Agronomic
 - Field applications, field GPS coordinates, specific machinery and any issues throughout the season (*n= 30+*)

PHW65 mini-NAM Maize Population

- PHW65 NAM-type population
 - PHW65 reference crossed with PHN11, Mo44 & MoG
 - DHs were derived from crosses
 - Location-specific testers were used to generate hybrids



PHW65 mini-NAM Maize Population

PHN11



*Iodent- type NSS, PI
601497
(ex-PVP x ex-PVP)*

Mo44



*Mo22 x Pioneer
Mexican Synthetic 17
(ex-PVP x old)*

MoG



*Mastadon
(ex-PVP x unselected)*

Miller et al., 2017

Location-specific Testers

PHT69



Northern

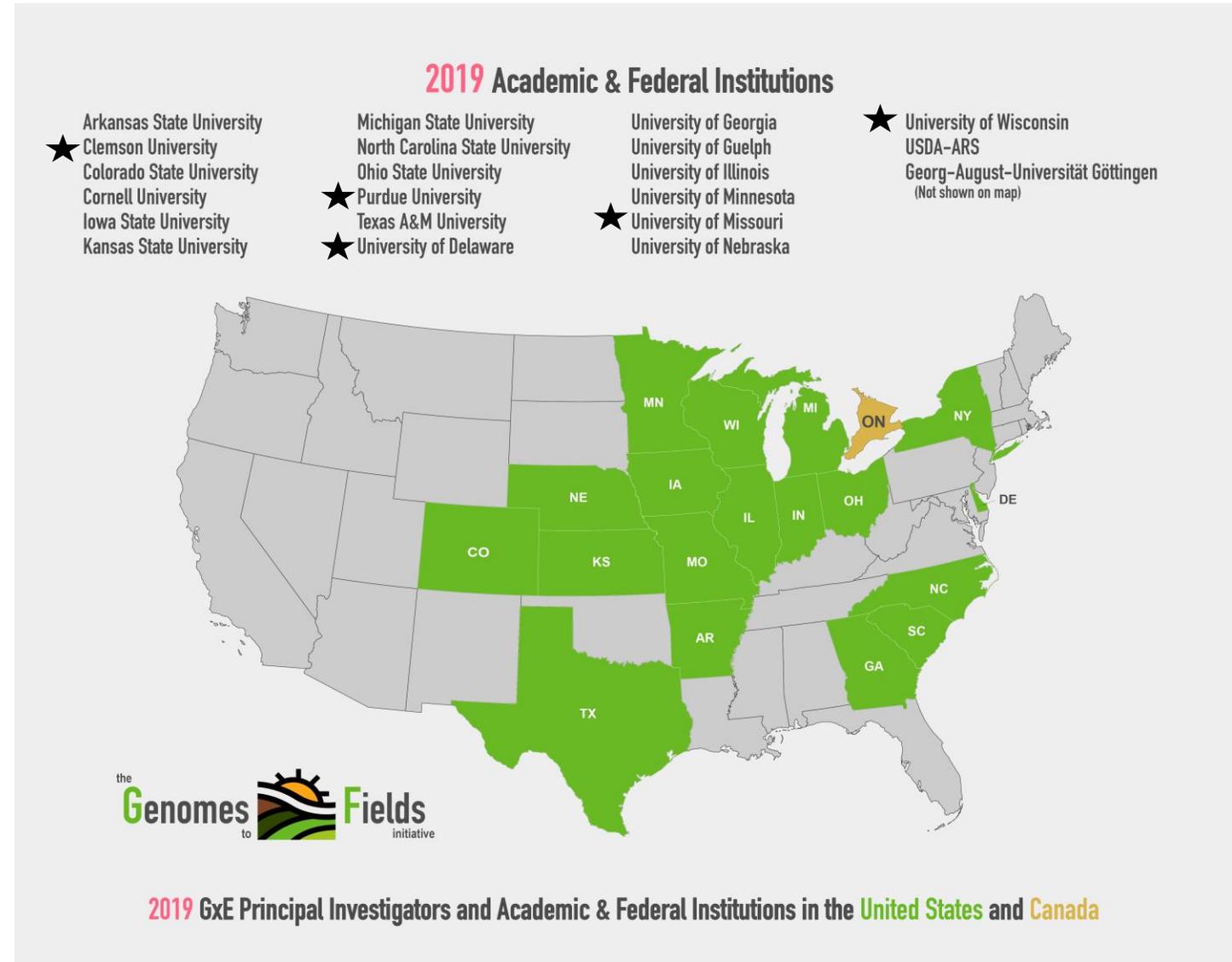
LH195



*Midwest to
Southern*

Preliminary Data

- DEH1
- INH1
- MOH1
- SCH1
- WIH1
- WIH2



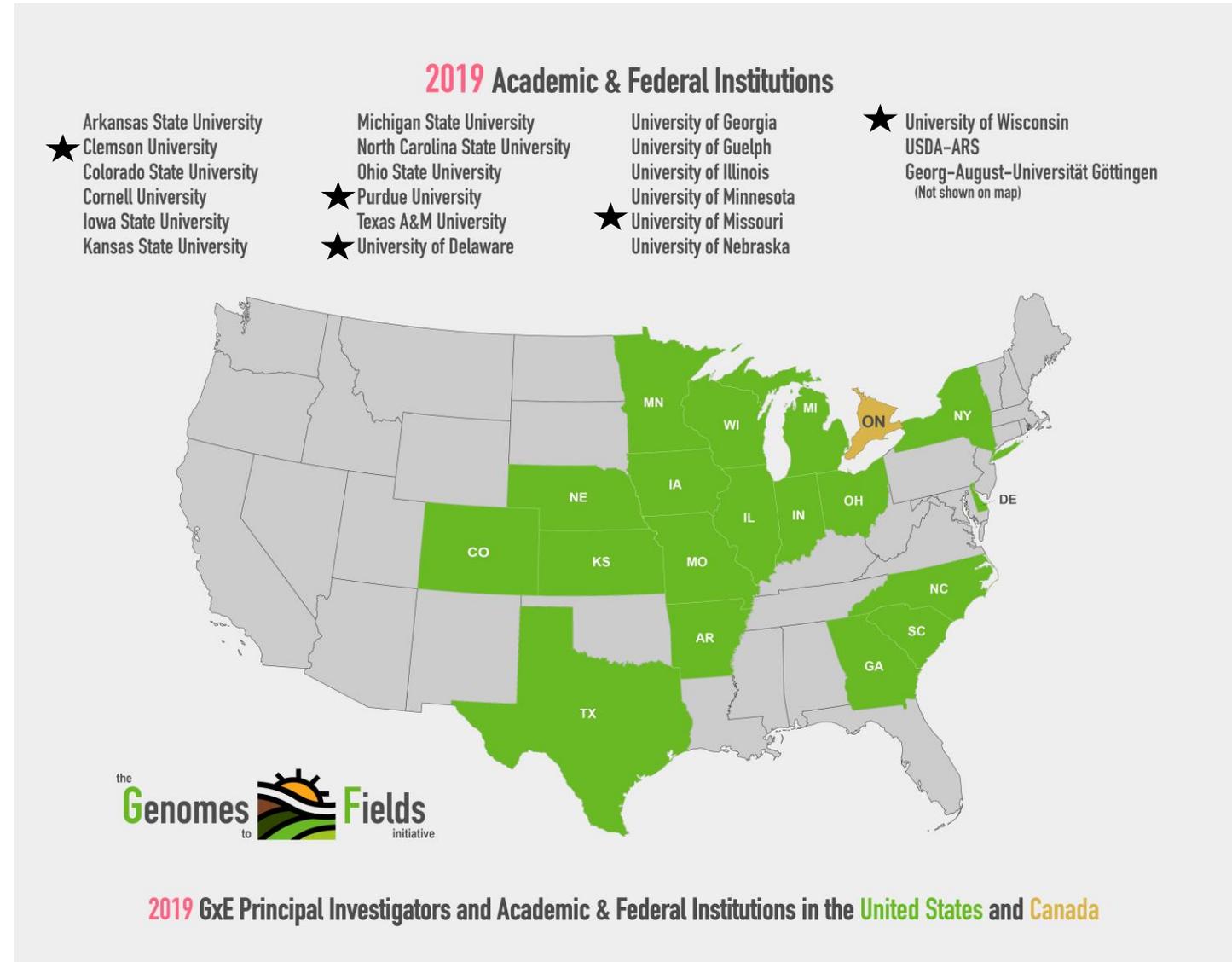
New
Coordinator

2019 Recap

2019 Data

Preliminary Data

- 5,200 plots planted,
3,582 plots post-cleaning
- PHN11: 1,246
- Mo44: 869
- MoG: 1,235
- LH195: 1,796
- PHT69: 1,786

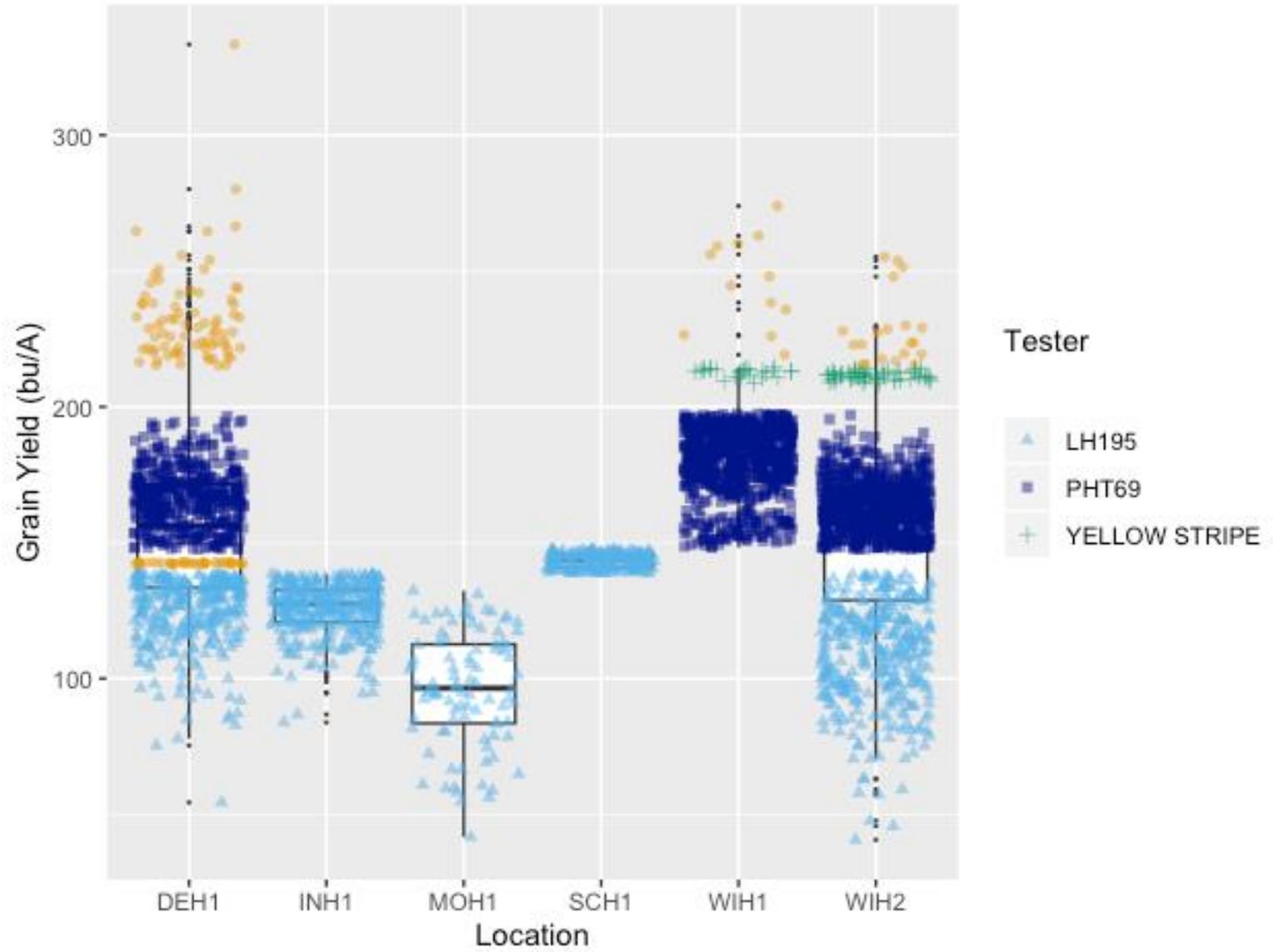
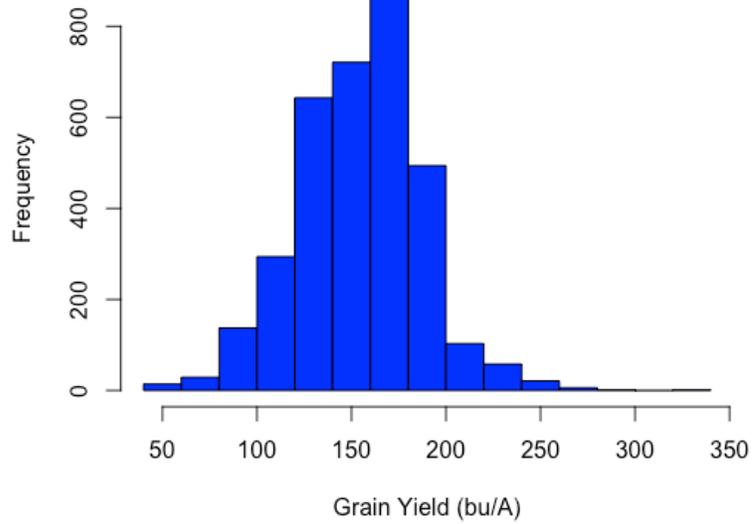


New
Coordinator

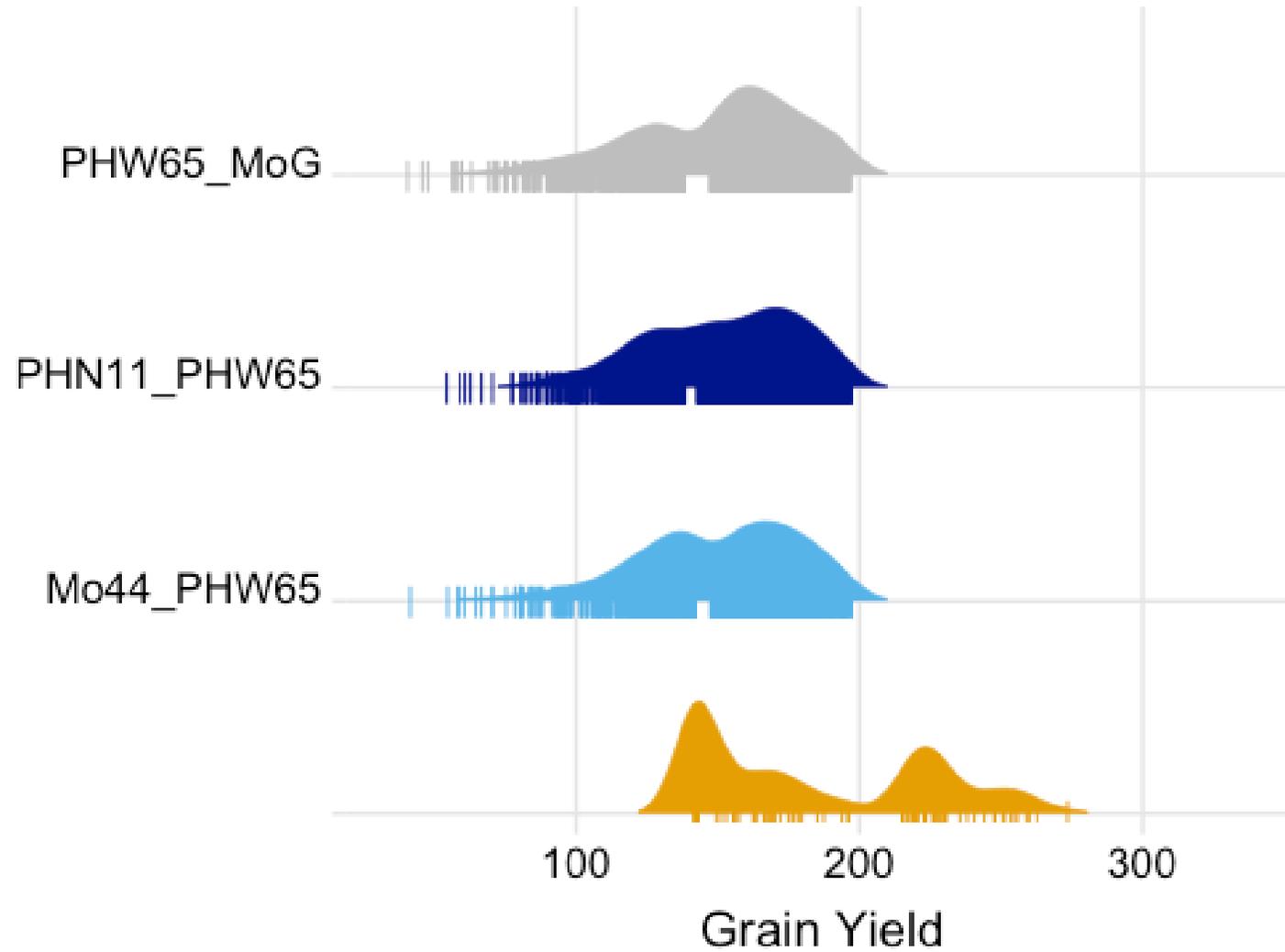
2019 Recap

2019 Data

Grain Yield



Yield by Family

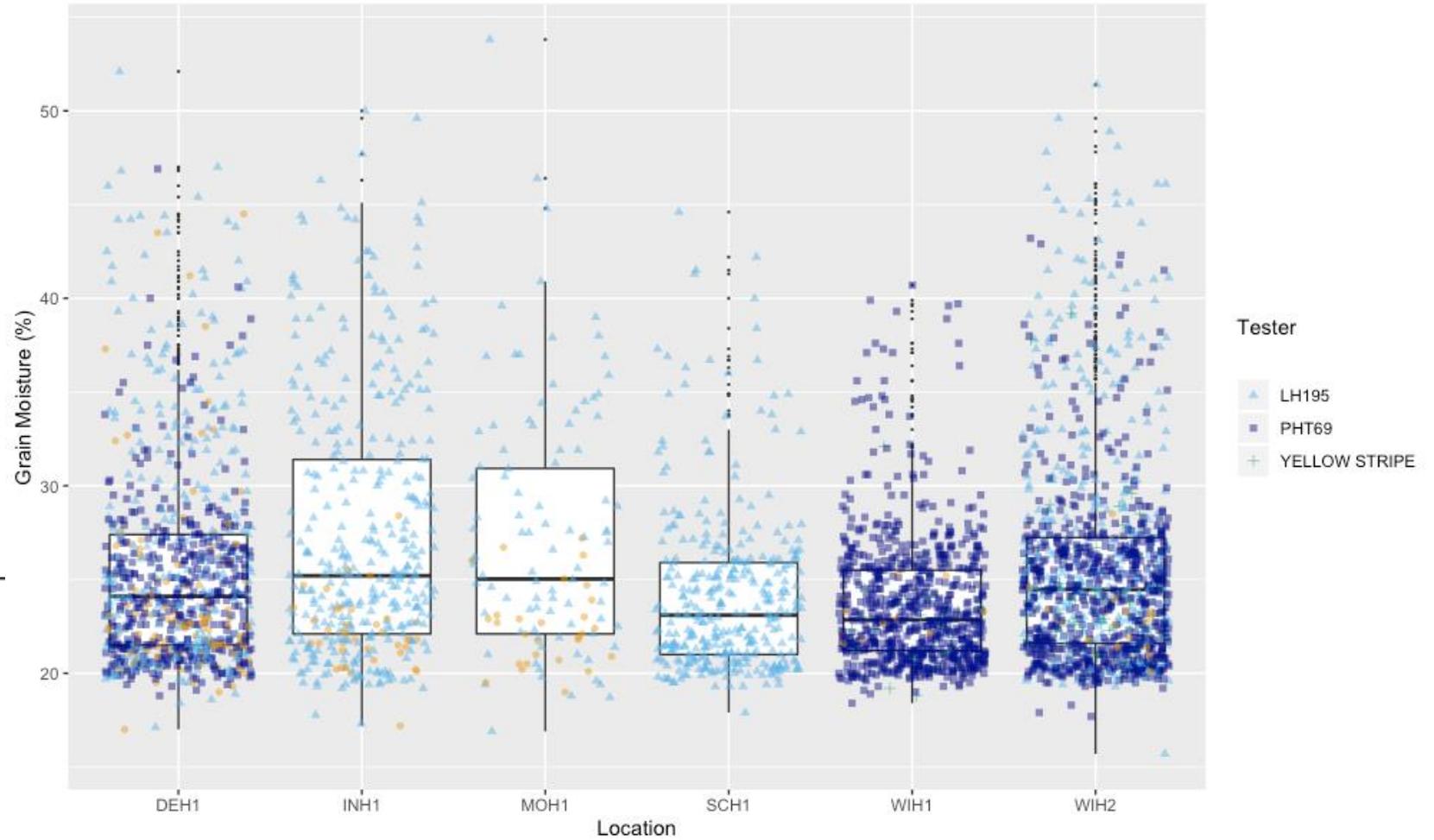
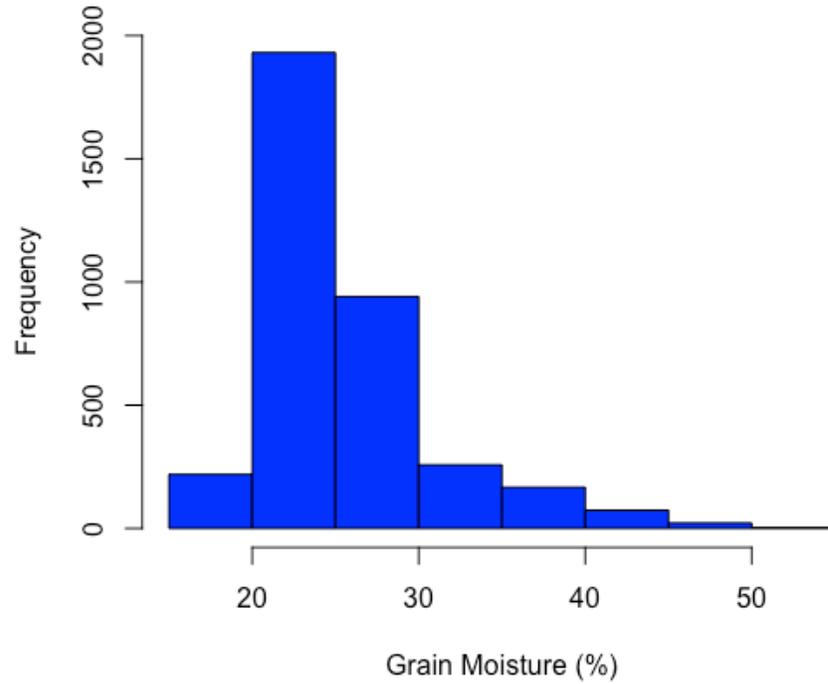


New
Coordinator

2019 Recap

2019 Data

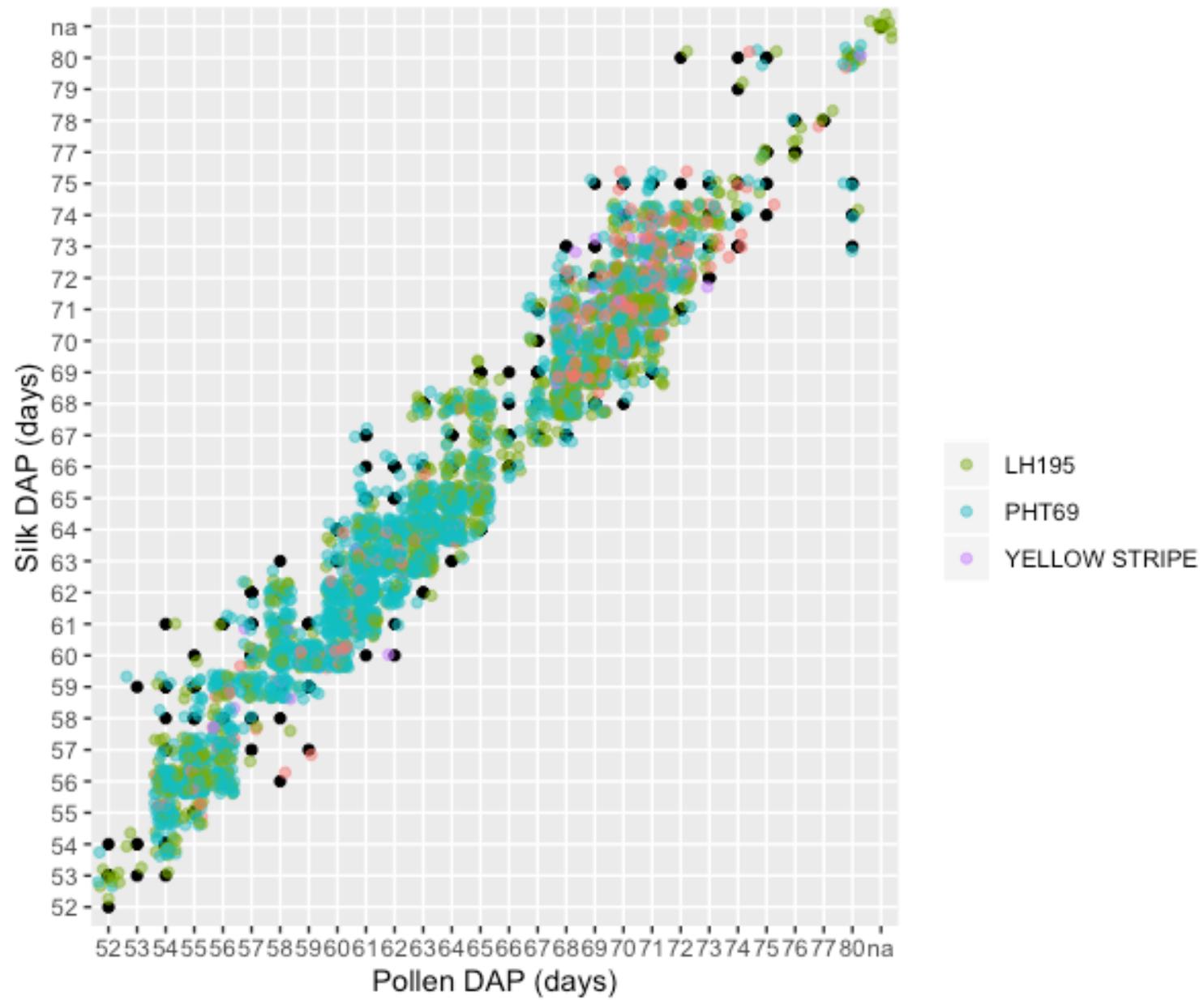
Grain Moisture



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Coordinator

2019 Recap

2019 Data

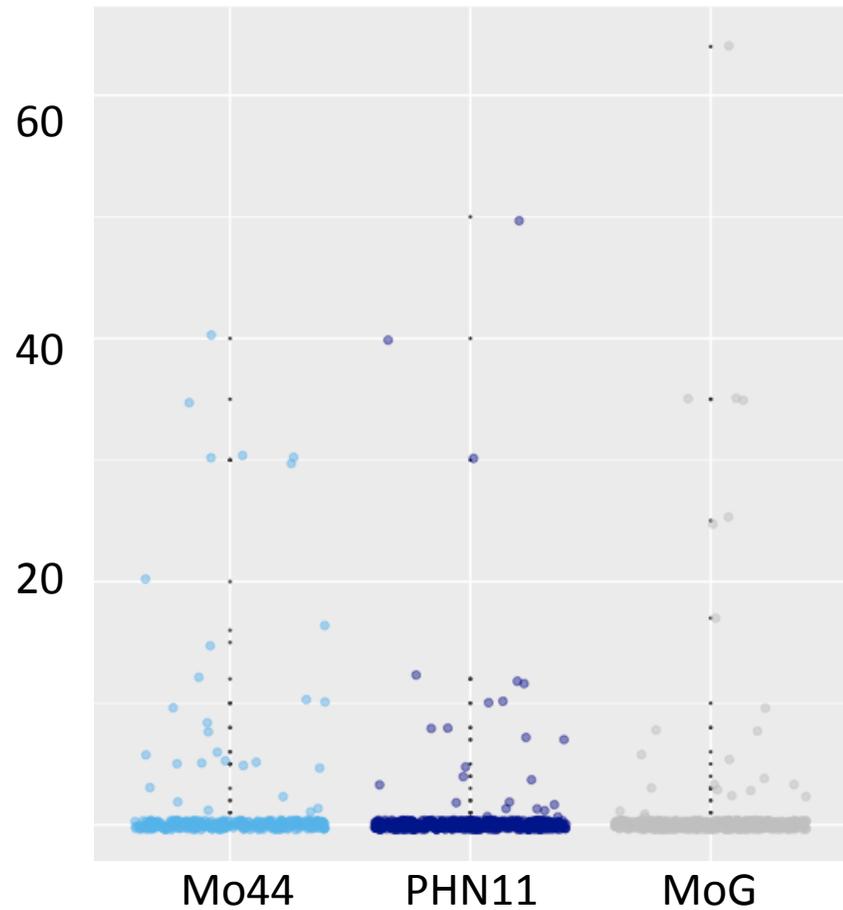


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Coordinator

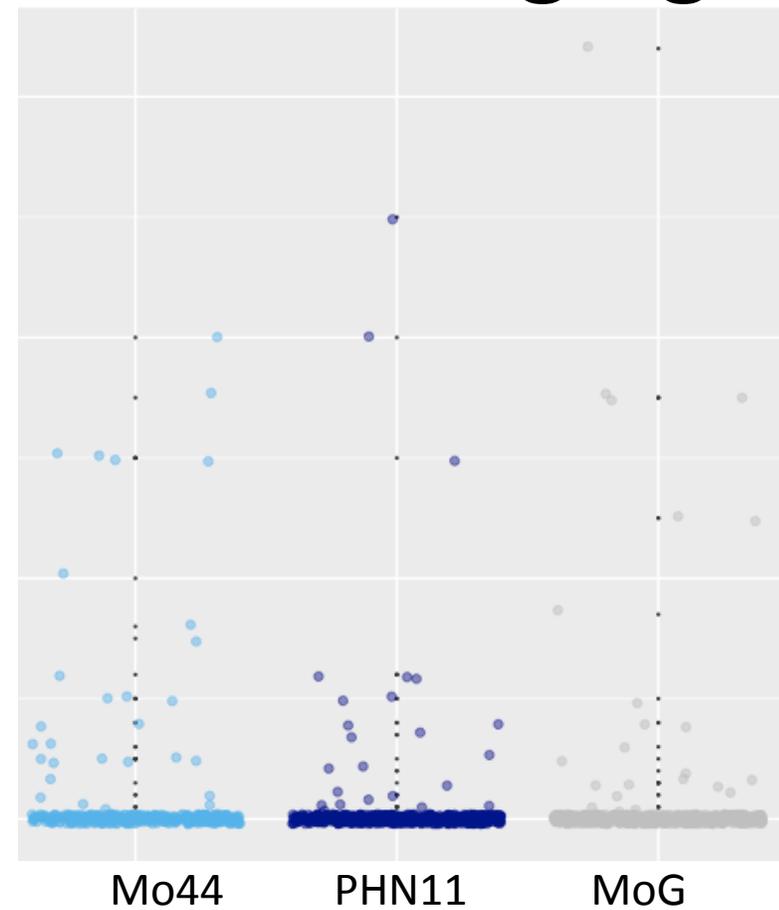
2019 Recap

2019 Data

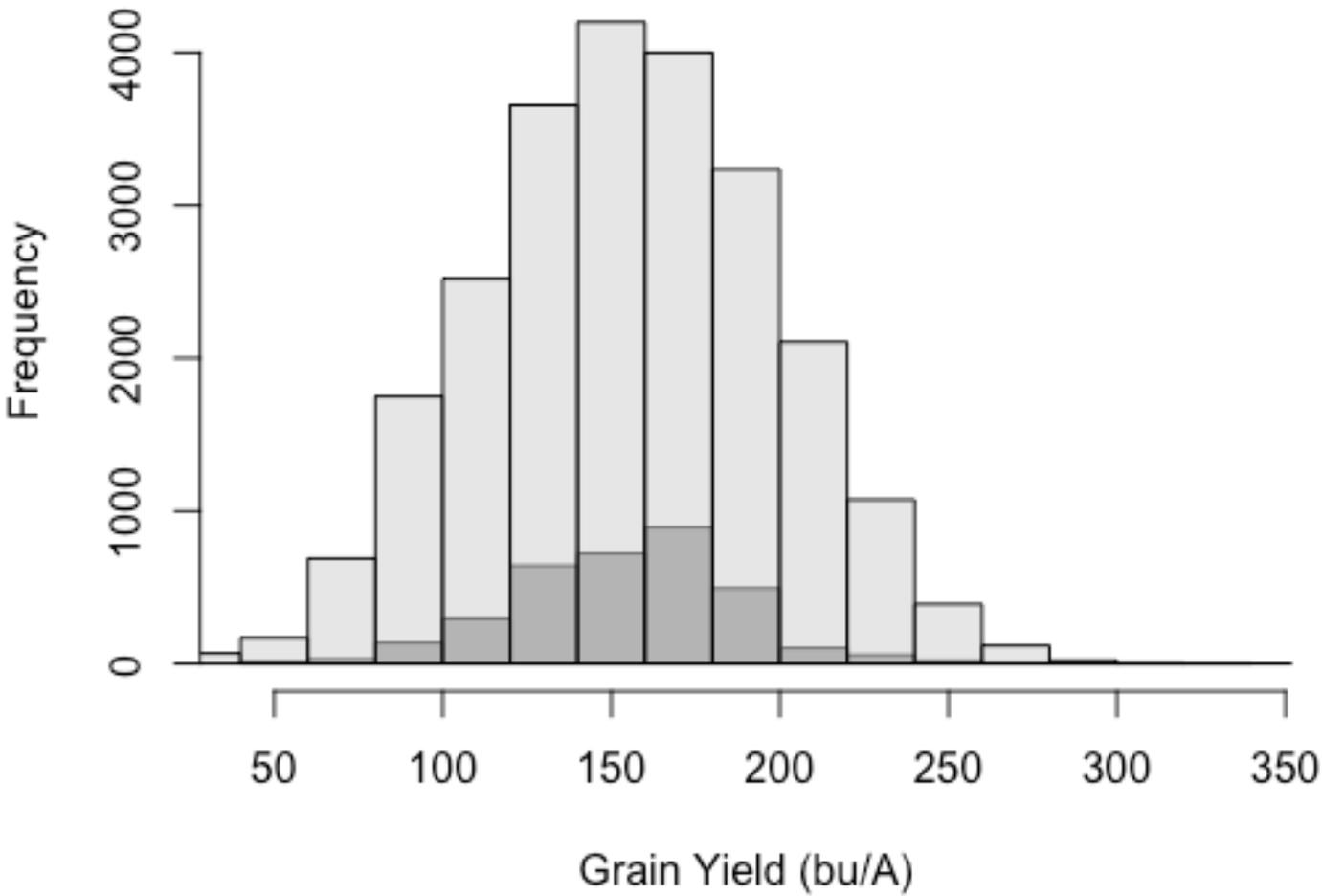
Stalk Lodging



Root Lodging



2018 vs 2019 Comparison



Soil Data (24 locations)

Soil pH	5.7 – 8.4
Organic Matter LOI %	0.6 – 5.3
Nitrate- N (ppm)	2 – 59
Potassium- K (ppm)	55 – 702
Sulfate-S (ppm)	3.4 – 28.05
CEC/Sum of cations (me/100g)	2.5 – 29.8
Texture (types)	Clay (2), Clay Loam (4), Loam (2), Loamy Sand (2), Sandy Clay Loam (8), Sandy Loam (1), Silty Clay Loam (5)

2014- 2017 DOI

- Currently under review at BMC Research Notes – hoping to get a decision soon!

2018 ARK

- All collaborators should have received a personal link to the 2018 ARK
- Please notify Alejandro if there are discrepancies in the datasets
- We will begin more thorough cleaning over the next couple months to stay on target for public release

🗂️ Parent folder for G2F data sets: <https://doi.org/10.25739/frmv-wj25>

Field Season	Release to Collaborators (ARK)	Release to Public (DOI)
2014	February 2017	https://www.doi.org/10.25739/9wjm-eq41 (Phenotypic, genotypic, and environment data)
2015	February 2017	https://www.doi.org/10.25739/kjsn-dz84 (Phenotypic, genotypic, and environment data)
2016	February 2017	https://www.doi.org/10.25739/yjnh-kt21 (Phenotypic, genotypic, and environment data)
2017	February 2018	https://doi.org/10.25739/w560-2114 (Phenotypic, genotypic, and environment data)
N	February of N+1	March of N+2

Reminders

- Submit 2019 field data using personalized Google Folder link
- Let Alejandro know ASAP if you will be participating in 2020
- Provide feedback about 2018 ARK – polishing for the March 2020 DOI will begin ASAP

Genomes To Fields Collaborators and Cooperators

- Tim Beissinger (Göttingen)
- Martin Bohn (UIUC)
- Ed Buckler (ARS)
- Darwin Campbell (ISU)
- Alejandro Castro (UW)
- Ignacio Ciampitti (KSU)
- Liang Dong (ISU)
- Jode Edwards (ARS)
- David Ertl (IA Corn)
- Sherry Flint-Garcia (ARS)
- Christopher Graham (SDSU)
- Candy Hirsch (UMN)
- Jim Holland (ARS)
- Elizabeth Hood (AR State)
- David Hooker (Guelph)
- Joseph Gage (Cornell)
- Jack Gardiner (ISU)
- Fiona Goggin (AR State)
- Byron Good (Guelph)
- Mike Gore (Cornell)
- Patricio Grassini (UNL)
- Jerry Hatfield (ARS)
- Diego Jarquin (UNL)
- Shawn Kaeppler (UW)
- Joe Knoll (ARS)
- Greg Kruger (UNL)
- Nick Lauter (ARS)
- Carolyn Lawrence-Dill (ISU)
- Liz Lee (Guelph)
- Natalia de Leon (UW)
- Sanzchen Liu (Kansas)
- Argelia Lorence (AR State)
- Aaron Lorenz (UMN)
- Jonathan Lynch (PSU)
- Bridget McFarland (UW)
- John McKay (Colorado)
- Nathan Miller (UW)
- Steve Moose (UIUC)
- Seth Murray (TAMU)
- Rebecca Nelson (Cornell)
- Torbert Rocheford (Purdue)
- Oscar Rodriguez (UNL)
- Cinta Romay (Cornell)
- James Schnable (UNL)
- Pat Schnable (ISU)
- Brian Scully (ARS)
- Rajandeep Sekhon (Clemson)
- Kevin Silverstein (UMN)
- Maninder Singh (MI State)
- Margaret Smith (Cornell)
- Edgar Spalding (UW)
- Nathan Springer (UMN)
- Srikant Srinivasan (ISU)
- Yiwei Sun (ISU)
- Kelly Thorp (ARS)
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Questions?

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