Karl Kunze

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Experience

Research Projects

- Weed Competitive Ability in Organic Spring Naked Barley by using collected field trait phenotypes and UAV imaging to measure barley vigor and growth in organic environments
- Genome wide association of disease resistance in organic naked barley
- Genetic characterization of barley disease resistance across 18 location by year field trials of a naked barley diversity panel
- Germination and malting quality traits of winter barley breeding lines
- Counducted research the USDA ARS Cereal Crops Research Unit in Madison, WI in December 2021 and January-February 2022 to assist in malting quality analysis of a subset of malting barley lines.
- Co-led a weekly graduate student journal club with Will Stafstrom in the Spring 2022 semester. Topics were related to current research and topics in the fields of plant breeding, genetics and crop science # Technical Skills
- Highly proficient in operating and data collection of a plant breeding program including recording field phenotypes, usuing phenotype and genotype data for selection decisions, processing, analysis, organization, and experimental design of field trials
- Highly proficient in R statistical software and Excel for data management and analysis
- Basic proficiency in Unix shell scripting and command line. Limited experience with Python
- Certified FAA UAS Part 107 Remote Pilots License.
- Highly Proficient in flying unmanned aerial systems for imaging of plant variety trials and breeding populations
- Basic proficiency in Agisoft Pro and Open Drone Map software stitching applications.
- Basic proficiency related to chemistry malting quality analysis for alpha-amylase, diastatic power, beta-glucan, soluble wort protein and free amino nitrogen

Awards Received

- Gerald O. Mott Award Recipient March 2022
- Cornell Plant Breeding and Genetics Munger-Murphy Award August 2022
- Recipient of the ASA, CSSA, SSSA Future Leaders in Science Award December 2018

Education

Undergraduate

- B.S. Plant Science concentration in Plant Breeding and Genetics, minor in Business for Life Sciences- Cornell University 2013-2017

Graduate

- Graduate Research Assistant, Graduate School Field of Plant Breeding minor in Plant Pathology and Food Science, Cornell University 2017-present

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Publications

1. Travis E. Rooney, Karl H. Kunze, Mark E. Sorrells. The Plant Genome(2022) Genome wide marker effect heterogeneity is associated with a large effect dormancy locus in winter malting barley. https://doi.org/10.1002/tpg2.20247
2. Bunting, J. S., Ross, A. S., Meints, B. M., Hayes, P. M., Kunze, K.,& Sorrells, M. E. (2022). Effect of Genotype and Environment on Food-Related Traits of Organic Winter Naked Barleys. *Foods*, *11*(17),2642.https://doi.org/10.3390/foods11172642
3. Chris Massman, Brigid Meints, Javier Hernandez, Karl Kunze, Patrick M.Hayes, Mark E. Sorrells, Kevin P. Smith, Julie C. Dawson, and Lucia Gutierrez. Crop Science(2022) Genetic Characterization of Agronomic Traits and Grain Threshability for Organic Naked Barley in the Northern U.S. https://doi.org/10.1002/csc2.20686
4. Sweeney, D.W., Kunze, K.H. & Sorrells, M.E. QTL x environment modeling of malting bar-