Karl Kunze

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Education

Undergraduate

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

Graduate

- PhD Candidate, advisor Dr. Mark Sorrells, Cornell University Graduate School, Field of Plant Breeding and Genetics, minor in Plant Pathology and Food Science 2017-present

Leadership Activities and Professional Services

- Student representative of the Crop Science Society of America(CSSA) executive board 2022-2023
- Representative of the CSSA science policy committee 2022-present
- Local Graduate Student Liaison member for the National Association of Plant Breeders(NAPB) Graduate Student Working Group Fall 2020-August 2021
- Cornell Plant Breeding and Genetics Graduate Student Association(Synapsis)-President 2018-2019
- Synapsis Professional Development Committee Member 2020-2021
- Corteva Symposium organizing committee member April 2019
- Graduate Student Representative on the Cornell Plant Breeding Faculty Search Committee Spring 2019

Awards and Grants Received

- USDA OREI grants program 2017-51300-26809 and 2020-51300-32179 "Developing Multi-use Naked Barley for Organic Systems"
- "Genetic Characterization of Germination Traits and Their Relationship to Preharvest Sprouting in Winter and Spring Barley"- American Malting barley Association Grant Award July 2021-June 2022
- Cornell Plant Breeding and Genetics Munger-Murphy Award August 2022
- Gerald O. Mott Award Recipient March 2022
- Recipient of the ASA, CSSA, SSSA Future Leaders in Science Award December 2018

Experience

Research Projects

- Measure components of weed competitive ability in organic naked barley variety trials by using field trait phenotypes and aerial imaging to measure barley vigor and growth
- Genome wide association studies of organic barley diversity panels across 13 location by year field locations throughout the Northern United Sates
- Genetic by environmental analysis of winter naked barley variety trials across 8 environments throughout the Northern United States
- Evaluation of dormancy and pre-harvest sprouting across a winter malting barley breeding population
- Evaluation of malting quality at the USDA ARS Cereal Crops Research Unit in Madison, WI December 2021 and January-February 2022

Technical Skills

- Highly proficient in operating and data collection of a plant breeding program including measurement field phenotypes and integrating genetic data to make selection decision and publish original research
- Highly experienced in processing, analysis, organization, and experimental design of field trials of a novel barley breeding program
- Highly proficient in R statistical software and Excel for data management and analysis. Moderate proficiency in using git version control
- Basic proficiency in Unix shell scripting and command line. Limited experience with Python and Docker.
- Highly proficient in flying unmanned aerial systems for imaging of plant variety trials and breeding populations & Certified FAA UAS Part 107 Remote Pilots License. 2019-present
- Basic proficiency in Agisoft Pro and Open Drone Map software stitching applications.
- Basic proficiency related to chemistry for malting quality analysis
- Demonstrated ability to work in multi-institutional collaborative projects
- Participated in an International exchange workshop between Cornell University, Tokyo University of Agriculture and Technology and the Technical University of Munich October 2019

Professional Societies

- Crop Science Society of America(CSSA) student member 2019-present
- National Association of Plant Breeders (NAPB) student member 2020-present
- New York State Agriculture Society member 2017-present
- Cornell Plant Breeding and Genetics Graduate Student Association, Synapsis 2017-present
- Alumni of Alpha Gamma Rho, Professional and Social Agricultural Fraternity, Zeta Chapter

Publications

1. Massman, C., Meints, B., Hernandez, J., Kunze, K., Smith, K. P., Sorrells, M. E., … & Gutierrez, L. Crop Science(2023) Genomic prediction of threshability in naked barley. https://doi.org/10.1002/csc2.20907
2. 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
3. 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
4. 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
5. Sweeney, D.W., Kunze, K.H. & Sorrells, M.E. QTL x environment modeling of malting barley preharvest sprouting. Theor Appl Genet (2021). https://doi.org/10.1007/s00122-021-03961-5

Outreach

- Interviewed with the Craft Maltsters guild on Breeding Malting Barley for New York State February 2022
- Presented on winter malting barley breeding progress for New York at the New York State Empire malting barley summit at the Culinary Institute of America, Hyde Park, NY December 2022
- Co-led a weekly graduate student journal club with Will Stafstrom. Topics were related to current research and topics in the fields of plant breeding, genetics and crop science. Spring 2022
- Spoke at numerous annual field days to discuss barley breeding and organic naked barley to the general community
- Wrote a brief article titled growing malting barley amid climate change for the American Malting Barley Association September 2022
- Guest on the "All Things Agriculture Podcast" with Eric Carey
- Presented an eOrganic webinar titled "Progress on Organic Naked Barley Breeding, Exploration of Organic Breeding Traits" April 2021

Research and Conference presentations

- Presented current research and status of the NY winter malting barley project at the NYS Empire Malt and Barley Summit at the Culinary Institute of America, Poughkeepsie, NY December 2022
- Presented research of "Interaction of Pre-harvest sprouting, germination rate and malting quality for winter and facultative malting barley" and "Genotype by Environment Interaction of Organic Winter Naked Barley" at CSSA annual meeting in Baltimore, Maryland November 2022
- Presented research of "Interaction of Pre-harvest sprouting, germination rate and malting quality for winter and facultative malting barley" at the 23rd North American Barley Researchers Workshop and 43rd Barley Improvement Conference UC Davis,CA September 2022
- Presented research of "Developing Winter Malting Barley for New York State" Michigan Beer and Malt Conference in Traverse City, MI January 2022
- Research Presentation titled "Components of Weed Competitive Ability" at CSSA,ASA and SSSA Tri-societies annual meeting in Salt Lake City, Utah November 2021
- Presenter at the Philly Malt and Grains Conference, Virtual March 2021