Karl Kunze

khk44@cornell.edu 585-813-9335 422 Bradfield Hall, Ithaca NY, 14853
karlkunze.github.io @kunzx37 karl-k-342908140 karlkunze

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

Experience

Research Projects

- Measure weed components of weed competitive ability in organic spring baked barley variety trials by using collected field trait phenotypes and UAV imaging to measure barley vigor and growth
- Genetic wide association studies of barley disease resistance across 18 location by year field locations throughout the Northern United Sates
- Genetic by environmental analysis of winter organic naked barley variety trials across 3 years and 3 locations throughout the Northern United States
- Evaluation of dormancy and pre-harvest sprouting across a double haploid winter malting barley breeding population
- Evaluation of malting quality of a subset of winter malting barley lines at the USDA ARS Cereal Crops Research Unit in Madison, WI in December 2021 and January-February 2022

Awards Received

- 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

Technical Skills

- Highly proficient in operating and data collection of a plant breeding program including recording field phenotypes, using phenotype and genotype data for selection decisions
- Highly experienced in processing, analysis, organization, and experimental design of field trials of the Cornell small grains breeding program
- Highly proficient in R statistical software and Excel for data management and analysis. Moderate proficency in using git version control
- Basic proficiency in Unix shell scripting and command line. Limited experience with Python and Docker
- Certified FAA UAS Part 107 Remote Pilots License. 2019-present
- Highly proficient in flying unmanned aerial systems for imaging of plant variety trials and breeding populations(conducted over 100 flights) 2019-present
- 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
- Demonstrated ability to work in multi-institutional collaborative projects

Professional Services

- Student representative of the CSSA(Crop Science Society of America) 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-Professional Development Committee Member 2020-2021
- Cornell Plant Breeding and Genetics Graduate Student Association Synapsis-President 2018-2019
- Corteva Symposium organizing committee member April 2019
- Graduate Student Representative on the Cornell Plant Breeding Faculty Search Committee Spring 2019

Professional Societies

- Tri societies CSSA(Crop Science Society of America) student member 2019-present
- National Association of Plant Breeders (NAPB) student member 2020-present
- New York State Agriculture Society member 2017-present
- Student Organic Seed Society member 2020-2021
- Cornell Plant Breeding and Genetics Graduate Student Association, Synapsis 2017-present

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 barley preharvest sprouting. Theor Appl Genet (2021). https://doi.org/10.1007/s00122-021-03961-5

Outreach

- 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
- Spoke at various summer annual field days to dicusss barley breeding and organic naked barley to the general community
- Brief article titled growing malting barley amid climate change https://ambainc.org/growing-malting-barley-amid-climate-change-the-challenge-of-pre-harvest-sprouting/
- Guest on the "All Things Agriculture Podcast" with Eric Carey https://www.youtube.com/watch?v=Dw_8N39wyBI
- Presented eOrganic Webinar Titled "Progress on Organic Naked Barley Breeding, Exploration of Organic Breeding Traits" April 2021 https://eorganic.info/node/23566

Research and Conference presentations

- Research Presentation titled "Interaction of Preharvest 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 September 2022, UC Davis,CA
- Research Presentation titled "Developing Winter Malting Barley for New York State" Michigan Beer and Malt Conference January 2022 Traverse City, MI
- Research Presentation titled "Components of Weed Competitive Ability" at CSSA,ASA and SSSA Tri-society annual meeting November 2021, Salt Lake City, Utah
- Presenter at the Philly Malt and Grains Conference, Virtual March 2021
- Attended Student Organic Seed Society (SOSS) conference- Madison, WI, August 2019
- Participant in the Tri-societies poster competition Baltimore, MD, November 2018 Attended NOFA-NY Organic Conference January 2018