

CURRICULUM VITAE

Karl Kunze

Current Position:

PhD Candidate in Plant Breeding and Genetics, advisor Dr. Mark Sorrells, Cornell University- 2017 present

Education:

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

Experience:

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

Research Projects:

Weed Competitive Ability in Organic Spring Naked Barley-Utilizing 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 double haploid barley breeding population- Genetic characterization of germination and malting quality traits of double haploid winter barley breeding lines.

Visited the USDA ARS Cereal Crops Research Unit in Madison, WI in December 2021 to assist in malting quality analysis of a subset of malting barley lines.

Skills:

Highly proficient in operating and data collection of a plant breeding program including recording field phenotypes, utilizing phenotype and genotype data for selection decisions, processing, analysis, organization, and 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 from 2019-present. Basic proficiency in Agisoft Pro and Open Drone Map software stitching applications.

Basic proficiency in chemistry malting quality analysis for alpha-amylase, diastatic power, beta-glucan, soluble wort protein and free amino nitrogen

Grants and Fellowships:

Developing Multi-use Naked Barley for Organic Farming Systems I & II: USDA-NIFA-OREI Grant 2017-51300-26809

American Malting Barley Association Grant 2020-2021- Genetic Characterization of Germination Traits and Their Relationship to Preharvest Sprouting in Winter and Spring Barley

American Malting Barley Association Grant 2021-2022- Germination Traits & Relationships to Pre-Harvest Sprouting

NYS Department of Agriculture and Markets Funding

Publications:

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>

Chris Massman, Brigid Meints, Javier Hernandez, **Karl Kunze**, Patrick M. Hayes, Mark E. Sorrells, Kevin P. Smith, Julie C. Dawson, and Lucia Gutierrez. *in prep, Crop Science*. **Genetic Characterization of Agronomic Traits and Grain Threshability for Organic Naked Barley in the Northern U.S.**(2021)

Professional Services:

Incoming Student representative of the CSSA(Crop Science Society of America) executive board 2022-2024

Local Graduate Student Liaison representative and member for the National Association of Plant Breeders (NAPB) Graduate Student Working Group, Fall 2020-2021

Cornell Plant Breeding and Genetics Graduate Student Association, Synapsis-Professional Development Committee Member, 2020-2021

Corteva Symposium organizing committee member at Cornell University, April 2019

Graduate Student Representative on the 2019 Cornell Plant Breeding Faculty Search Committee-Spring 2019

Cornell Plant Breeding and Genetics Graduate Student Association, Synapsis-President, 2018-2019

Plant Breeding Field representative for the Cornell Graduate and Professional Student Association, 2017-2019

Graduate student representative on the Cornell University, College of Agriculture and Life Sciences alumni committee, 2018-present

Professional Societies:

Tri societies CSSA(Crop Science Society of America) and ASA(American Society of Agronomy)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

Alumni of Alpha Gamma Rho, Zeta Chapter-Cornell University

Presentations and Conferences attended:

Research Presentation titled “Components of Weed Competitive Ability” at CSSA, ASA and SSSA Tri-society annual meeting 2021, Salt Lake City, Utah

Presented eOrganic Webinar Titled “Progress on Organic Naked Barley Breeding, Exploration of Organic Breeding Traits” April 2021

Presenter at the Philly Malt and Grains Conference, March 2021

Attended Student Organic Seed Society (SOSS) conference- Madison, WI, August 2019

Recipient of the 2019 ASA, CSSA, SSSA Future Leaders in Science Award, March 2019

Participant in the Tri-societies poster competition Baltimore, MD, November 2018

Attended NOFA-NY Organic Conference January 2018