

# Seren Villwock

Ithaca, New York, USA  
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## EDUCATION

**Cornell University, PhD candidate** (GPA: 4.145 / 4.3)  
Plant Breeding and Genetics Section, School of Integrative Plant Sciences  
Minors: Plant Genetics and Plant Molecular Biology

Ithaca, NY  
2020 - present

**Lewis & Clark College**  
Bachelor of Arts in Biology with honors (GPA: 4.0 / 4.0)  
Study abroad: **School for International Training** Peace & Conflict Studies

Portland, OR  
2015 - 2018  
Rwanda & Uganda  
2016

## RESEARCH EXPERIENCE

**Graduate research fellow**  
Cornell University, School of Integrative Plant Sciences  
Field of Plant Breeding and Genetics (Advisor: Dr. Jean-Luc Jannink)

Ithaca, NY  
AUG 2020 - present

- Integrating genomic, transcriptomic, and metabolite data to investigate interactions between carotenoid and starch metabolism in biofortified cassava
- Employed multivariate mixed linear models to conduct a genome-wide association study for negatively correlated quality traits
- Fine-mapped a wild introgression segment to distinguish effects on yield, quality, and genetic load
- Designed and employed a panel of KASP markers to screen for wild introgressions
- Led 2 years of field trial data collection at the International Institute of Tropical Agriculture, Nigeria in collaboration with the NextGen Cassava Breeding Project
- Mentored and supervised 4 undergraduate research summer interns

**Undergraduate researcher**  
Lewis & Clark College (Advisor: Dr. Paulette Bierzychudek)

Portland, OR  
JAN - DEC 2018

- Completed honors thesis entitled: "Evaluating the Potential for the Evolution of Polygenic Glyphosate Resistance in Portland Populations of the Landscape Weed *Cardamine hirsuta*"
- Discovered genetic variance in glyphosate sensitivity among *C. hirsuta* populations using dose-response curve modeling and assessed response to selection with glyphosate exposure
- Mentored 2 research assistants through first-generation student research experience program

**NSF Research Experience for Undergraduates internship**  
Donald Danforth Plant Science Center (Advisor: Dr. Malia Gehan)

St. Louis, MO  
MAY - AUG 2018

- High-throughput phenotyping of *Setaria viridis* diversity panel under heat and drought stress
- Quantified growth curves and stress responses using Python-based image analysis tool "PlantCV"

## TEACHING EXPERIENCE

**Graduate Teaching Assistant**  
Introduction to Evolutionary Biology and Diversity course, Cornell University

Ithaca, NY  
JAN - MAY 2023

- Taught five one-hour discussion sections weekly, graded assignments, and assisted students with course material in office hours

**Lab and Teaching Assistant**  
Biology Department, Lewis & Clark College

Portland, OR  
SEPT 2015 - DEC 2017

- Assisted with lab preparation and teaching of Investigations in Genetics & Evolutionary Biology Lab
- Provided weekly one-on-one tutoring for students in Cell Biology and Ecology courses

## WORK & SERVICE EXPERIENCE

### Synapsis Leadership

Cornell Plant Breeding & Genetics Graduate Student Association

Ithaca, NY

SEPT 2020 - present

- Co-President ('23-24), Chair of Cornell Corteva Symposium 2023 ('22-23); Leadership Council ('20-21); Social Committee ('20-'22); Diversity & Inclusion Council representative ('21-23)

### Plant Tissue Culture Technician

Conception Nurseries

Portland, OR

OCT 2019 - JUNE 2020

- Cultured and propagated plantlets using sterile technique in production environment
- Optimized micropropagation methods to increase production efficiency

### Farming for Peace Program Logistics Manager

Children of Peace Uganda

Lira, Uganda

OCT 2015 - SEPT 2017

- Developed and implemented a two-month agricultural training course for youth affected by war in Uganda in collaboration with a nonprofit; funded by \$10,000 grant from Davis Projects for Peace

## GRANTS AND SCHOLARSHIPS

2024	NAPB Borlaug Scholar
2023	USDA NIFA Predoctoral Fellowship (\$180,000)
2023	Russell R. Billings Graduate Assistantship Award
2022	Schmittau-Novak School of Integrative Plant Science Grant (\$9,000)
2022	Honorable Mention, NSF Graduate Research Fellowship Program
2020	Cornell University Graduate Recruitment Fellowship
2018	Phi Beta Kappa induction & Oregon STEM Scholarship
2017	Davis Projects for Peace Grant (\$10,000)
2016 - 2018	Kent Swanson Jr. Memorial Biology Scholarship
2015 - 2018	Lewis & Clark Trustee Endowed Scholarship
2015 - 2018	Lewis & Clark Leadership & Service Award Scholarship

## PUBLICATIONS

**Villwock, S.;** Parkes, E; Mbanjo, G; Rabbi, Y; Jannink, JL. *Bivariate genome-wide association study reveals polygenic contributions to negative covariance between total carotenoid and dry matter contents in yellow-fleshed cassava*. In prep (2024).

**Villwock, S.;** Li, L; Jannink, JL. *Carotenoid-carbohydrate crosstalk: Evidence for genetic and physiological interactions in storage tissues across crop species*. New Phytologist, accepted pre-publication (2024).

Chan, A.; **Villwock, S.;** Williams, A.; Jannink, JL. *Sexual dimorphism and the effect of wild introgressions on recombination in cassava (*Manihot esculenta* Crantz) breeding germplasm*. (2022) *G3* 12(1).

Brzozowski, L.; Hanson, S.; Jannink, J.; Meints, B.; Moore, V.; Tufan, H.; **Villwock, S.** *Towards Equitable Public Sector Plant Breeding In The US*. (2022) *Crop Science*. doi: 10.1002/csc2.20800.\*

\*Outstanding Paper in Crop Breeding and Genetics Award 2023

## PRESENTATIONS

*Multivariate genome-wide association study for carotenoids and dry matter, correlated traits in cassava*. Plant Breeding & Genetics Seminar presentation, March 5 2024, Cornell University, Ithaca, New York.

*Examining carotenoid regulation and interactions with carbohydrate metabolism in cassava roots*. Poster presentation. National Association of Plant Breeders Conference, July 17 2023, Greenville, South Carolina.

*Examining the regulation of carotenoid content and its interactions with carbohydrate metabolism in cassava*. Plant Breeding & Genetics Seminar presentation, May 2 2023, Cornell University, Ithaca, New York.

*Everything home gardeners want to ask about plant breeding*. Cornell Cooperative Extension Master Gardeners

presentation, March 3 2023, Cornell University, Ithaca, New York.

*Plant Breeding for Equitable Futures Symposium..* ASA-CSA-SSSA International Annual Meeting, Nov. 8 2022, Baltimore, Maryland.

*Examining linkage drag in the Manihot glaziovii introgression on cassava chromosome 1.* Poster presentation. NextGen Cassava Annual Conference, Sept. 15 2022, Abuja, Nigeria.

*Examining effects of the Manihot glaziovii introgression on cassava chromosome 1.* Plant Breeding & Genetics Seminar presentation, March 15 2022, Cornell University, Ithaca, New York.

*Understanding the negative correlation between carotenoids and dry matter content in cassava.* International Institute of Tropical Agriculture research presentation. Aug. 9 2021, Ibadan, Nigeria.

## PROFESSIONAL AFFILIATIONS

Crop Science Society of America, National Association of Plant Breeders, National Center for Faculty Development and Diversity

## RELEVANT SKILLS

<b>Quantitative Genetics</b>	Genome-wide associations, mixed linear modeling, genetic mapping
<b>Bioinformatics</b>	Multiple sequence alignment, genomic data analysis, RNAseq analysis
<b>Programming</b>	R, Python, Unix, LaTeX, Git