

Andy Blunk

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EDUCATION

M.S., Agricultural and Environmental Plant Science **May 2020-August 2022**
Pennsylvania State University, University Park, PA

International Agriculture and Development (Dual-Title) **May 2020-August 2022**
Pennsylvania State University, University Park, PA

Urban Agriculture Fellowship **July 2018**
Tricycle Urban Ag, Richmond, VA

B.S., Environmental Science **May, 2014**
Juniata College, Huntingdon, PA

West African Studies, Semester Study Abroad Program **May, 2011**
University of The Gambia, Brikama, The Gambia

RESEARCH EXPERIENCE

Investigating Production Capabilities and Uses of Black Soldier Fly Larvae (BSFL) for organic waste processing in the Urban Environment **June 2024- Present**

Circular Agriculture Solutions and Future Acres Farm, Fairfax VA

- Supported farm manager to develop experimental design looking at venting rate, and BSFL density to optimize management of a BSFL urban composting system
- Project updates: https://projects.sare.org/sare_project/fs24-375/

AI analysis of soil pH using smartphone camera images **March 2024- Present**

Circular Agriculture Solutions, project manager, The Gambia West Africa

- Developed research project, and raised funds to collect 2000 soil samples across The Gambia and train a ML model to predict soil pH
- Project updates: <https://experiment.com/projects/ai-analysis-of-soil-ph-with-a-smartphone-camera>

Use of Oyster Industry By-Products to Improve Soil Health **Nov. 2023 - Present**

Circular Agriculture Solutions, project manager, The Gambia West Africa

- Coordinated the collaboration of two non-profits, local extension agents, and a local microfinance company to acquire materials and create the plan to conduct this research project

- With local partners, designed a randomized complete plot design study on 4 farms, to investigate the effects of oyster shells on groundnut production, and soil health
- Oversaw implementation of the research project through remote communication with partners
- Project updates: [Improving Soil Health with Oyster Industry "Waste" | Experiment](#)

Hydroponics System Comparison: Basil Quality, Yield and Resource Use Efficiency

May 2020 - Jan 2022

Vegetable Research Lab, Graduate Student Assistantship, Pennsylvania State University, Rock Springs, PA

- designed randomized split plot study, set and managed basil production in Nutrient Film Technique (NFT), Deep Water Culture (DWC), Air-Gap (Kratky), Sub-Irrigation (Ebb and Flow) hydroponic systems in 2020 and 2021 summer growing seasons
- collected and analyzed (SAS) data on resource use: electricity, water, nutrients of each system and; yield, and nutritional quality (phenolics, antioxidant activity) of test crop
- Published October 2023: <https://doi.org/10.17660/ActaHortic.2023.1377.85>

Nitrogen and Grafting Tomato Response: Yield, Quality and N-Use Efficiency

May 2020 - November 2021

Vegetable Research Lab, Graduate Student Assistantship, Pennsylvania State University, Rock Springs, PA

- conducted experimental laboratory soil testing protocols on soil solution samples from Rock Springs and Pennsylvania Farms
- prepared, planted and managed tomato crop high tunnel study (2020 and 2021) and conducted weekly harvest, soil sampling and biometric assessments
- examined soil monitoring protocols efficacy and accuracy against laboratory methods
- examined agronomic, physiological and quality responses of grafted and non-grafted tomatoes to various nitrogen inputs
- published Oct. 2023: <https://doi.org/10.17660/ActaHortic.2023.1377.98>

Nitrate Sensors as Educational Tools in Lab-Limited Extension System Environments

Dec 2021 - July 2022

International Agriculture and Development, Graduate Student Assistantship, Pennsylvania State University, Rock Springs, PA

- trained Ethiopian agriculture extension agents in the sonneveld 1:2 v/v soil sampling and testing method
- conducted a survey through extension agents to assess the applicability and feasibility of using decentralized soil Nitrate testing as an educational tool among rural Ethiopian Farmers

Barley Cultivar Variety Trial

June, 2016 - October, 2016

Agriculture and Environment Extension Agent, Peace Corps, Ethiopia

- Prepared, planted and managed a study of 100, 5x5m plots with 25 experimental barley cultivars developed by the Agriculture Transformation Agency of the Ethiopian Ministry of Agriculture
- Conducted a monthly, subjective evaluation of plots based on growth, color, pest presence, disease presence and weed presence with 30 model farmers and submitted results to the Ethiopian government

Undergrad Senior Capstone

January, 2014 – May, 2014

Juniata College, Huntingdon, PA

- Conducted vegetative and geophysical characterization of a 170-acre nature preserve owned by Juniata College
- Developed a GIS model mapping of the nature preserve for use by Juniata College

Turf Grass Lab Technician Assistant

June, 2010 – August, 2010

Penn State University, State College, PA

- Collected data on hundreds of small plots of turf grass
- Combined, measured and stored small chemical mixtures for spraying on turf grass in the lab

PROFESSIONAL SUMMARY

Experienced agriculture professional with extensive background in project management, nutrient management and monitoring, urban agriculture consultancy, and research assistance. Proficient in developing and executing agricultural projects with a focus on sustainability, community engagement, and economic development. Adept at fostering relationships among diverse stakeholders, including producers, agribusiness, and community leaders. Skilled in delivering research-based agricultural solutions and committed to advancing agricultural practices in urban and rural settings.

PROFESSIONAL HISTORY

Urban Agriculture Consultant

November 2022-June 2024

- Conducted agricultural artificial intelligence literature review and stakeholder outreach for Artificial Intelligence company, helped identify 2 projects, and begin grant writing process
- Worked alongside various farms in D.C., Arlington, Boston, Vermont, Chicago and Georgetown (Guyana), including Grateful Greens Vermont LLC, Boston Microgreens, South Side Blooms, CV Farms, Future Acres LLC, Roots 'n Shoots Microgreens
- Developed and wrote several research proposals for grant RFP's for improving energy use efficiency of indoor vegetable crops, and incorporating insect composting use in urban agriculture, for urban farms in D.M.V. area.
- Created an urban farm plan, including how to set up new farm locations, general crop plans, and infrastructure development plans in order to increase production capabilities of the farm

- Conducted a lifecycle analysis of the respective energy use of indoor, vertical farms, and greenhouse farms, growing microgreens that are marketed to the NE USA, to be used for strategic energy use decisions
- Developed a pitch deck for investors distilling newest research articles on the benefits of microgreens, which secured the largest sales account for the company
- Increased nutritional quality, yield and shelf life of indoor, hydroponics, microgreen crops through improving nutrient application and light management, and educated farm staff to adopt practices
- Conducted an audit of hydroponic farming practices in a 10-tunnel hydroponics farm, growing diverse vegetables which resulted in improved yields of arugula, tomato and lettuce by 50%, 65% and 35% respectively by correcting nutrient solution measurements that were causing nutrient deficiencies, blossom end rot and tip burn

Agriculture Intensification Project Manager

June 2022-Present

J&B Agriculture and Female Entrepreneurs Microfinance, Old Jeshwang, The Gambia

- Wrote, awarded two grants, and currently leading the associated project management, one project is research focused and the other extension-based implementation; both focused on improving soil amendments for soil acidity management in agricultural systems in West Africa
- Created a network of US-based researchers, 2 Gambian non-profits and local agriculture extension agents, to implement an agriculture intervention project with 10 farmers in 2023. The project plan was based on preliminary testing and surveying among farmers in the summer of 2022.
- Managed a team to conduct community needs assessment, materials acquisition, tilling, planting and community technical training events of groundnut (peanut), cassava, and pepper demonstration farm plots in Mbanta, The Gambia
- Led strategic planning and recommendation for microfinance interventions that 1) increased yield by 80% for sustainable production of groundnuts (peanuts) 2) reliable repayment by lenders

Horticulture Research Assistant

April 2020- August 2022

Penn State University State College, PA

- Assisted in the Horticulture department under Professor Francesco Di Gioia managing the studies on basic hydroponic, indoor and high tunnel vegetable production
- Designed randomized split-plot studies, set and managed basil, tomato and microgreens, production in Nutrient Film Technique (NFT), Deep Water Culture (DWC), Air-Gap (Kratky), Sub-Irrigation (Ebb and Flow) hydroponic systems and conducted experimental laboratory soil testing protocols; in 2020, 2021, 2022 growing seasons
- Educated farmers and extension agents on soil monitoring techniques to reduce nitrogen leaching
- Educated gardeners and locally interested public on hydroponic growing basics, systems and techniques
- Collected and analyzed (SAS) data on resource use: electricity, water, nutrients of each system and; yield, and nutritional quality (phenolics, antioxidant activity) of test crops and soil parameters

Farm Co-Owner and Manager**Feb 2019-2020***Eighth 'N Acre LLC, Charlottesville, VA*

- Founded and operated a small peri-urban, sustainable diverse vegetable farm outside Charlottesville, VA. focused on farmers markets and restaurant sales
- Managed all aspects of business from business creation to day-to day operations; including: business registration, business plan, market plan, project management, farm task management, farm operations, value added product development, accounting, sales, customer relations
- Developed value added products adhering to Virginia Department of Agriculture and Consumer Services regulations for sale at local farmers markets
- Established an online presence to sell value-added agriculture products

New Roots Farm and Community Garden Specialist**April 2018- May 2020***International Rescue Committee, Charlottesville, VA*

- Developed picture-based agriculture education modules for socially disadvantaged farmers and gardeners, relating to 50+ farming subjects, to be published through New Entry Sustainable Farming initiatives
- Participated in New Entry's National Incubator Farm Training Initiative (NIFTI)
- Co-developed in-depth agriculture education modules for use within all New Roots offices
- Co-facilitated non-formal education programs and workshops for refugee farmers, monthly, regarding different farm management techniques spanning all subjects related to small scale farming in Virginia
- Coordinated and led weekly and monthly meetings for 5 community gardens and farming program, with over 60 refugee clients
- Managed group of 5-20 volunteers to work on farm every week
- Led periodic farmer meetings and farm walks

Garden Coordinator and Educator**Sept. 2018 - June. 2019***City Schoolyard Garden, Charlottesville, VA*

- Developed garden-based lesson plans for kindergarten through 4th grade science, mathematics, english, and general classes to be used by the organization and public school
- Taught weekly garden-based science, english, and math classes to students aged 5-11
- Coordinated and planned with teachers to use garden to support each grade's learning objectives throughout the year
- Every month introduced new foods to the school cafeteria and led volunteers to teach about the new foods to students during lunch times
- Managed all aspects of garden including: vegetable gardens, pollinator habitat, fruit trees and bushes, compost, shed and tools

Agriculture and Environment Extension Agent**January, 2015 – October, 2017**

Peace Corps, Ethiopia

- Advised and taught a team of 10 local beekeepers to improve beekeeping practices, increase colony survival rate, build top-bar hives, and increase knowledge around hive management techniques
- Implemented the Farmer Field School extension methodology with 20 model farmers and facilitated weekly meetings, covering topics on : green manures, soil science, row planting, intercropping, integrated pest management
- Developed an apple management training curriculum (50 hours) and trained fellow peace corps volunteers, Ethiopian extension agents, and 20 model farmers from the Bole Bacho community.
- Conducted >70 house visits with 40 apple tree owners to provide field based training on proper tree management and ongoing practices to increase yield, health of trees and to improve the overall ability of farmers to manage their orchards.
- Co-managed an experimental plot in the Farmer Training Center (FTC) to teach 500 farmers about intercropping, non-chemical pest control, and cover cropping throughout the barley and fava bean cropping seasons.

Garden and Teacher Assistant

September, 2014- December, 2014

Urban Sprouts, San Francisco, California

- Taught secondary school students proper gardening techniques and awareness of food systems in urban environments

PRESENTATIONS

Aug. 2022

International Symposium on Innovative Technologies and Production Strategies for Sustainable Controlled Environment Horticulture - Yield, Quality and Resource Use Efficiency of Basil Grown in Alternative Soilless Growing Systems

Aug. 2022

International Symposium on Innovative Technologies and Production Strategies for Sustainable Controlled Environment Horticulture - Real-Time, On-Farm Soil Monitoring Methods for In-season Management of Fertigation in Vegetable Crop Protected Cultivation Systems

Mar 2022

Pennsylvania Vegetable Growers Association- Basil Yield, Quality and Resource Use Efficiency using Alternative Soilless Systems (Hydroponics)

Feb 2022

Pennsylvania Vegetable Growers Association- Grafted and Non-Grafted Response to Nitrogen Inputs in High Tunnel Production Systems

Feb 2022

Science to Practice Workshop- Extension Educator Soil Sampling Protocol to Monitor In-Season Soil Nitrate Levels

Dec 2021

American Society of Horticultural Science conference- Evaluation of on-farm soil monitoring techniques for in-season fertigation management for vegetables in high tunnel environments

Aug 2021

American Society of Horticultural Science conference- Nitrogen input effects on grafted and non-grafted tomato fruit yield, quality and plant biomass accumulation in high tunnel production system environments

Aug 2021

Penn State Arboretum- Rooted in Water: Management Basics of Hydroponics and the “Kratky” method for Youth and Adults

Aug 2021

International Rescue Committee New Roots Photovoice Project- Photo gallery representation of effects of urban gardening and farming on the lives of resettled refugees in Charlottesville, VA

Jan. 2019

Ethiopian Peace Corps Stakeholders meeting- Peace Corps Development model and effectiveness in rural Ethiopian context, Addis Ababa, Ethiopia

July, 2017

Liberal Arts Symposium- The Peace Chapel: Past and Present Vegetative and Geophysical Characterization and Future Management Recommendations, Huntingdon, PA

April, 2014

GRANTS

Frugal Science Grant- AI Analysis of Soil pH with a Smartphone Camera

\$10,000 June, 2024

SARE - Investigating production capabilities and uses of Black Soldier Fly Larvae (BSFL) for organic waste processing in the urban environment

\$20,000 February, 2024

Citizen Diplomacy Action Fund - Using community on-farm research projects to educate and empower farming communities

\$10,000 February, 2023

Experiment crowdfunding- Using Oyster Shells to Address Soil Health

\$5,000 January, 2023

CAS Graduate Student Travel Awards

\$1,000 January, 2022

INTAD competitive grant- Assessing the Feasibility of an On-Farm, Soil Testing Protocol in Resource-Limited Agricultural Extension Context, as a Soil Fertility Management and Educational Tool, Primary Applicant

\$5,000 December, 2021

Science to Practice- Soil Monitoring Protocol in High Tunnel Production Systems, Secondary applicant

\$10,000 October 2021

Penn State University Arboretum Tygel Programs - Hydroponics youth education program,
Primary Applicant

\$2,000 April, 2021

Rivanna Garden Club - Refugee community gardens development project, primary applicant

\$2,000 December, 2019

Feed the Future (USAID) – Apple Orchard Management Trainings (Ethiopia), primary applicant

\$5,000 January, 2017

Let Girls Learn (USAID) – Youth Empowerment Camp (Ethiopia), primary applicant

\$5,000 July, 2017

HONORS & AWARDS

Distinguished Plant Science Graduate Student Scholarship

June, 2021

The William A. Schlichter Award

May, 2014

Awarded to Juniata College student who exhibits academic achievement, dedication to Juniata and promise of future success

SKILLS & CERTIFICATIONS

Farm related

Small engine repair and maintenance

Operate small farm machinery: roto-tiller, riding mower, weedwacker, BCS, water pump, etc

Design, set up, run, manage common irrigation systems

Operate and maintenance of small farm tools: backpack sprayer, push seeders, cultivators, broadfork, etc.

Produce and food safety Certification

June, 2018

Beekeeping 101 Certification , Penn State University

August, 2015

Urban Agriculturalist Certification

November,

2018

Technology related

Proficient in: Statistical analysis software (SAS, R), GIS, Microsoft Office, Asana, Slack,

Microsoft Teams, Java programming and HTML web development

Extension related

- Photo-based farm education methodology for outreach to non-english farmers
- Photovoice evaluation methodology facilitation
- Community Needs Assessment tools (PACA): community mapping, community priority ranking, community seasonal calendar

Language

Afan Oromo, (East African Language) Advanced High Proficiency (ACTFL)
French, Intermediate Proficiency

October, 2017