Aaron I. Plex Sulá

2550 Hull Road, Gainesville, FL 32611 Cell (WhatsApp) +(502) 35719893
plexaaron@ufl.edu, plexaaron@gmail.com Google Scholar Observable Twitter GitHub

Current areas of research – Global surveillance and mitigation systems; global pathogen and pest diversity; geographic pest and pathogen risks; invasion and epidemic networks; landscape epidemiology; research collaboration networks; geographic information systems (GIS); artificial intelligence (AI).

Education

2022 – 2025	**University of Florida, Gainesville, Florida – College of Agricultural and Life Sciences** PhD student in Plant Pathology (GPA 4/4)
2016 – 2019	**EAP Zamorano – Panamerican School of Agriculture (Escuela Agrícola Panamericana)** **University of Zamorano, Honduras** Bachelor in Agricultural Sciences and Livestock Production (GPA 3.8/4)
2013 – 2015	**ENCA National School of Agriculture (Escuela Nacional Central de Agricultura), Guatemala** Agronomist

Professional experience

2020 – 2021	**Research scholar in Dr. Karen Garrett's lab** Network analysis in epidemic systems: Cropland connectivity and international trade networks Coordinating research workshops
2019	**Intern in Dr. Gary Vallad's lab** Chemical and biological control of *Fusarium oxysporum* as a soil-borne disease on tomatoes: Laboratory, greenhouse, and field research
2010 – present	**Smallholder farmer, Guatemala** Vegetable production focused on tomato, maize, green and dry beans, bell peppers, pea, tomatillo, and *Cucurbita pepo*.
2015	**Manager assistant at AGROBELSA, HAME, Guatemala** Banana production: Specialized in banana flower and fruit management and irrigation system
2014-2015	**Manager of a small company** Greenhouse production and commercialization of the mushroom *Pleurotus ostreatus*
2013-2019	**Learning by doing programs offered by Zamorano and ENCA** Extensive field and laboratory experience in four components: Agribusiness (e.g., cost-benefit analysis, marketing) Food sciences (e.g., dairy processing, honey processing) Environmental sciences (e.g., organic agriculture, forest management) Agricultural sciences (e.g., ornamentals and plant propagation)

Awards

2016 – 2019	Academic Excellence Honor, EAP Zamorano
2016 – 2019	Full bachelor scholarship awarded by FONAGRO-ENCA 2015

2013 – 2015 Discipline Excellence Honor, ENCA
2013 – 2015 Full high-school scholarship awarded by ENCA

Volunteer services

1. **Journal peer reviews**

- Radici A, Martinetti D, Bevacqua D. 2023. Global benefits and domestic costs of a cooperative surveillance strategy to control trans-boundary crop pathogens. *Plants, People, Planet*.
- Gilbert GS, Parker IM. 2023. The population ecology of plant disease in *The evolutionary ecology of plant disease*. Chapter 10.
- Gilbert GS, Parker IM. 2023. Spatial ecology in *The evolutionary ecology of plant disease*. Chapter 11.

2. **Conference moderator**
   Moderated Technical Session: Regulatory Plant Pathology in Plant Health 2023, Denver, CO.
   Contact reference: Megan Boatman (mboatman@scisoc.org)
3. **National insect collection building**
   Started a self-funding project to build the first insect collection of flesh flies (Sarcophagidae) in Guatemala.
   Contact reference: Dr. Enio Cano (RIP)
4. **Undergraduate tutoring**
   Performed extracurricular activities by tutoring undergrad classes (mathematics 1, 2 and 3 and physics) in Zamorano University, Honduras.
   Contact reference: Dr. Josue Molina (jmolina@zamorano.edu)

Teaching experiences

- **2024** Co-instructor, Network Analysis in Plant Pathology Research Workshop, Plant Health 2024, Memphis, TN, United States.
- **2022** Co-instructor, International Workshop on Network Analysis in Agricultural Systems, University of Agriculture Faisalabad, Pakistan.
- **2021** Co-instructor, Impact Network Analysis Workshop (PLP 4932), University of Florida, United States.

Memberships

- Member of the American Phytopathological Society (APS): 2020-2024.
- Member of the American Association for the Advancement of Science (AAAS): 2024.

Affiliations

- Department of Plant Pathology, University of Florida.
- Global Food Systems Institute, University of Florida.
- Emerging Pathogens Institute, University of Florida.

Skills

- Programming languages: R.
- Spoken languages: English and Spanish.

Publications

Journal articles

- Alcalá-Briseño RI, Batuman O, Brawner J, Cuellar WJ, Delaquis E, Etheron BA, French-Monar RD, Kreuze J, Navarrete I, Ogero K, **Plex Sulá AI,** Yilmaz S, Garrett KA. 2023. Translating viromes analyses to support phytosanitary policies and regulations, crop breeding, and on-farm management. *Frontiers in Plant Science* 14:1056603. DOI: 10.3389/fpls.2023.1056603
- Etherton BA, Choudhury RA, Alcalá-Briseño RI, Xing Y, **Plex Sulá A,** Carrillo D, Wasielewski J,

Stelinski L, Grogan KA, Ballen F, Blare T, Crane J, Garrett KA. 2023. Are avocados toast? A framework to analyze decision-making for emerging epidemics, applied to laurel wilt. *Agricultural Systems* 206: 103615. DOI: 10.1016/j.agsy.2023.103615

- Garrett KA, Bebber DP, Etherton BA, Gold KM, **Plex Sulá AI**, Selvaraj MG. 2022. Climate change effects on pathogen emergence: Artificial intelligence to translate big data for mitigation. *Annual Review of Phytopathology* 60(16):1-22. DOI: 10.1146/annurev-phyto-021021-042636
- Buddenhagen CE, Xing Y, Andrade Piedra JL, Forbes GA, Kromann P, Navarrete I, Thomas-Sharma S, Choudhury RA, Andersen Onofre KF, Schulte-Gelderman E, Etherton BA, **Plex Sulá AI,** Garrett KA. 2021. Where to invest project efforts for greater benefit: A framework for management performance mapping with examples for potato seed health. *Phytopathology* 112 (7): 1431-1443. DOI: 10.1094/phyto-05-20-0202-r

Book chapters

- Garrett KA, Thomas-Sharma S, Forbes GA, Hernandez Nopsa JF, **Plex Sulá AI**. 2023. Climate change and plant pathogen invasions. Chapter 3. In: Ziska L. Invasive species and global climate change, 2nd edition. *CAB International*: 22-49. DOI: 10.1079/9781800621435.0002
- Alcalá-Briseño RI, **Plex Sulá AI**, Etherton BA, Andersen Onofre KF, Poudel R, Xing Y, Garrett KA. 2022. Adapting crop disease management to global change. Chapter in Vegetable Disease Management. Invited, currently in review.

Software development

- Keshav K, **Plex Sulá AI,** Garrett KA. 2023. 'geohabnet': Geographical risk analysis based on habitat connectivity. CRAN: https://cran.r-project.org/web/packages/geohabnet/index.html

Journal articles in review

- **Plex Sulá AI**, De Col V, Etherton BA, Xing Y, Agarwal A, Ramic L, Bonaiuti E, Friedmann M, Proietti C, Thiele G, Garrett KA. 2024. What traits of collaboration networks are associated with project success? The case of two CGIAR agricultural research programs for development. Agricultural Systems, pending revisions.

Preprints

- Mouafo-Tchinda RA, Etherton BA, **Plex Sulá AI**, Andrade-Piedra J, Ogero K, Omondi BA, McEwan M, Tene Tayo PM, Harahagazme D, Cherinet M, Gebeyehu S, Sperling L. Garrett KA. 2024. Pathogen and pest risks to vegetatively propagated crops in humanitarian contexts: geographic priorities for Cameroon and Ethiopia. DOI: 10.1101/2024.02.12.580019
- Etherton BA, **Plex Sulá AI**, Mouafo-Tchinda RA, Kakuhenzire R, Hassaye HA, Asfaw F, Kosmakos VS, McCoy RW, Xing Y, Yao J, Sharma K, Garrett KA. 2024. Translating Ethiopian potato seed networks: identifying strategic intervention points for managing bacterial wilt and other diseases. DOI: 10.1101/2024.02.12.579952

Presentations

Invited webinars

- **Plex Sulá A**. 2022. Global structures of trade networks to prioritize phytosanitary efforts for crop pathogen and pest spread: challenges and opportunities. Institut national de la recherche agronomique (INRAE), France.
- Garrett KA, Etherton BA, **Plex Sulá A**. 2022. Scaling up of disease management to climate change. In Climate change – Emerging pathogens. Plant Health 2022 virtual session.

Contributed presentations

- **Plex Sulá A**, Garrett KA. 2024. Global host-pathogen infection networks in major terrestrial agroecosystems. *International Epidemiology Workshop*, Foz do Iguaçu, Brazil.

- **Plex Sulá A**, de Toledo Franceschi B, Mouafo-Tchinda RA, Garrett KA. 2024. Proactive biosecurity priorities revealed by the global biogeography of 1000 plant pathogens. *Invasion Science Research Symposium*, Gainesville, FL, United States.
- **Plex Sulá A**, Choudhary M, Etherton BA, Mouafo-Tchinda RA, Garrett KA. 2023. Proactive global biosecurity strategies: Priorities based on crop landscapes, trade networks, and the ecological niches of 930 pathogens. *International Congress of Plant Pathology*, Lyon, France.
- **Plex Sulá A**, Avelino J, Choudhary M, Cuellar W, Etherton BA, Gazis R, Kreuze JF, Mouafo-Tchinda RA, Suresh LM, Garrett KA. 2023. Proactive global biosecurity priorities based on crop landscapes, trade networks, and the ecological niches of 930 pathogens. *Plant Health 2023*, Denver CO. DOI: 10.1094/PHYTO-113-11-S3.1
- Mouafo-Tchinda RA, **Plex Sulá A**, Etherton B, Choudhary M, Choudhury R, Gazis R, Crane J, Garrett KA. 2023. Building global surveillance and mitigation strategies for laurel wilt. *International Congress of Plant Pathology*, Lyon, France.
- Mouafo-Tchinda RA, **Plex Sulá A**, Etherton BA, Choudhary M, Choudhury RA, Gazis R, Crane J, Garrett KA. 2023. Global surveillance and mitigation strategies for laurel wilt: protecting avocado production and forests. *Plant Health 2023*, Denver CO.
- Choudhary M, **Plex Sulá A,** Penca C, Lagos LC, Mouafo-Tchinda RA, Etherton BA, Garrett KA. 2023. Cut flower trade risk analysis to protect global agriculture from invasive pests and pathogens. *Plant Health 2023*, Denver CO. DOI: 10.1094/PHYTO-113-11-S3.1
- Etherton BA, Asfaw F, Kakuhenzire R, Kassaye HA, Kosmakos VS, McCoy RW, **Plex Sulá A**, Xing Y, Yao J, Garrett KA. 2023. Systems analysis for pathogen management, with examples for Ethiopian potato seed networks. *Plant Health 2023*, Denver CO. DOI: 10.1094/PHYTO-113-11-S3.1
- **Plex Sulá A**, et al (17 co-authors). 2022. Translating cropland and trade connectivity for mitigation of emerging pathogens: Priority locations globally and focusing on the Americas. *Plant Health* 2022, Pittsburgh PA. DOI: 10.1094/PHYTO-112-11-S3.1
- Mouafo-Tchinda RA, **Plex Sulá A**, Etherton B, Xing Y, Choudhury R, Grogan K, Garrett KA. 2022. Avocado laurel wilt: Scenario analysis to support mitigation strategies before laurel wilt spreads to new regions. *Plant Health* 2022, Pittsburgh PA. Phytopathology 112: S3.12. DOI: 10.1094/PHYTO-112-11-S3.1
- **Plex Sulá A**, Alcalá-Briseño RI, Xing Y, Etherton B, Andrade-Piedra JL, Vallad GE, Garrett KA. 2022. Geographic disease risk analysis in the Caribbean and globally, with examples including potato and tomato. *Entomological Society of America and APS Caribbean Division*, Puerto Rico, March 27th.
- Garrett KA, Etherton B, **Plex Sulá AI**. 2021. Scaling up management of epidemics. University of Florida, Plant Pathology seminar. September 7.
- **Plex Sulá A**, et al (12 co-authors). 2021. Geographic disease risk analysis for major crops of Central America and Mexico: Regional analyses and global structures. Plant Health 2021, online. *Phytopathology* 111 (10s): S2.157. DOI: 10.1094/PHYTO-111-10-S2.1
- Xing Y, **Plex Sulá A**, Alcalá-Briseño RI, Choudhury R, Andersen KF, Garrett KA. 2021. Cropland connectivity: Best practices for incorporation in geographic risk analyses. Plant Health 2021, online. *Phytopathology* 111 (10s): S2.48. DOI: 10.1094/PHYTO-111-10-S2.1

Oral keynote presentations

- Garrett KA, **Plex Sulá A**. 2022. Network analysis in agricultural systems to address grand challenges to food security. International symposium, Faisalabad, Pakistan.
- Garrett KA, Etherton B, **Plex Sulá A**. 2022. Identifying effective locations for mitigation of emerging pests and diseases. Entomological Society of America and APS Caribbean Division, Puerto Rico, March 29th.
- Garrett KA, **Plex Sulá A.** 2021. Global change: Adapting coffee pest and disease management. Global change: Adapting coffee pest and disease management. Plenary session – keynote lecture. 28th Conference ASIC (Association for Science and Information on Coffee) 2021.

- Garrett KA, Etherton BA, **Plex Sulá AI**. 2021. Key global networks for protecting plant health and food security: The connected networks of social, ecological, economical, cultural, and disease components of plant health. Oral lecture. Global Plant Health Assessment (GPHA).

Posters

- **Plex Sulá A**, Choudhary M, Etherton BA, Mouafo-Tchinda RA, Garrett KA. 2023. Surveillance and mitigation strategies for wheat based on crop landscapes, trade networks, and the ecological niches of 100 pathogens. *International Congress of Plant Pathology*, Lyon, France.
- **Plex Sulá A**, Choudhary M, Etherton BA, Mouafo-Tchinda RA, Garrett KA. 2023. Global surveillance and mitigation based on wheat landscapes, trade networks, and the biogeography of 100 pathogens. *Plant Health 2023*, Denver CO.
- Mouafo-Tchinda RA, Etherton BA, **Plex Sulá A**, Choudhary M, Tene-Tayo PM, Adhikari A, Harahagazwe D, Andrade-Piedra J, McEwan M, Garrett KA. 2023. Pathogen and pest risk assessment in banana, cassava, potato, and sweet potato production in Cameroon. *Plant Health 2023*, Denver CO.
- Mouafo-Tchinda RA, **Plex Sulá A**, Okonya J, Nakato V, Xing Y, Choudhary M, Alcalá-Briseño R, Blomme G, Kantungeko D, Kreuze J, Nduwayezu A, Legg J, Garrett KA. 2023. Crop pathogen severity and pests in banana, cassava, potato, and sweetpotato production in the Lake Kivu region of Rwanda and Burundi. *International Congress of Plant Pathology*, Lyon, France.
- **Plex Sulá A**, Etherton BA, Garrett KA. 2022. Prioritizing phytosanitary efforts based on global cropland and trade connectivity risks of emerging pathogens and pests. International Plant Health Conference, London.
- Mouafo-Tchinda RA, **Plex Sulá A**, Etherton BA, Kraisitudomsook N, Xing Y, Choudhury RA, Grogan K, Garrett KA. 2022. Global analysis of the invasion risk of *Harringtonia lauricola*, causal agent of laurel wilt. *International Plant Health Conference*, London, United Kingdom.
- Etherton BA, Choudhury R, Alcalá-Briseño RI, Xing Y, **Plex Sulá A**, Carillo DA, Wasielewski J, Stelinski LL, Grogan K, Ballen F, Blare T, Crane J, Garrett KA. 2022. The influences of information exchange on collective action during emerging epidemics and invasions. *Plant Health 2022*, Pittsburgh PA.
- **Plex Sulá A**, Mouafo-Tchinda RA, Xing Y, Garrett KA. 2022. Global networks of cropland connectivity and avocado disease risk. *Entomological Society of America and APS Caribbean Division*, Puerto Rico.
- Etherton BA, Choudhury R, Xing Y, Carillo DA, Stelinski LL, Crane J, Alcalá-Briseño RI, **Plex Sulá A**, Wasielewski J, Grogan K, Blare T, Garrett KA. 2022. Are avocado toast? Understanding how farmer's management decisions impact the avocado laurel wilt epidemic in Florida. *Entomological Society of America and APS Caribbean Division*, Puerto Rico.
- McCoy RW, Qin C, Stilian E, Suder P, Andersen Onofre K, Etherton BA, **Plex Sulá A**, Xing Y, Garrett KA. 2022. Decision support for regional disease and pest management interventions: New features in the INA R package. *Entomological Society of America and APS Caribbean Division*, Puerto Rico.
- **Plex Sulá A**, Xing Y, Alcalá-Briseño RI, Etherton B, Andersen Onofre K, Andrade-Piedra J, Hodson D, Jarvis A, Kreuze JF, Sonder K, Suresh LM, Garrett KA. 2021. Análisis de riesgo de factores geográficos en las enfermedades de cultivos de mayor importancia en Centro América y México: estructuras globales y análisis regional. *5 Congreso Argentino de Fitopatología*, Argentina.
- **Plex Sulá A**, Xing Y, Alcalá-Briseño RI, Etherton B, Andersen K, Andrade-Piedra J, Hodson D, Jarvis A, Kreuze JF, Sonder K, Suresh LM, Garrett KA. 2021. Geographic disease risk analysis for major crops of Central America and Mexico: regional analyses and global structures. *Plant Health 2021*.
- Xing Y, **Plex Sulá A**, Alcalá-Briseño RI, Etherton B, Choudhury R, Andersen Onofre K, Garrett KA. 2021. Cropland connectivity: best practices for incorporation in geographic risk analyses. Research on-demand poster. *Plant Health 2021*.
- **Plex Sulá A**, Xing Y, Alcalá-Briseño RI, Etherton B, Andersen K, Andrade-Piedra J, Hodson D,

Jarvis A, Kreuze JF, Sonder K, Suresh LM, Garrett KA. 2021. Geographic disease risk analysis for major crops of Central America and Mexico: regional analyses and global structures including cacao and tomato. *17th Biennal Florida Phytopathology Society Meeting*

- Xing Y, **Plex Sulá A,** Alcalá-Briseño RI, Garrett KA. 2021. Incorporating cropland connectivity as a new standard feature of geographic risk assessment and surveillance strategies. Research On-Demand Poster. *APS Southern Division Virtual Meeting*. Phytopathology 111 (9s): S1.7. DOI: 10.1094/PHYTO-111-9-S1.1

Theses

- **Plex Sulá AI**. 2019. Decomposer insects associated with chicken and pig carrion in Zamorano. 12 dipteran species were new country records for Honduras. Unpublished, bachelor thesis. EAP Zamorano, Honduras.
- **Plex Sulá AI**. 2015. Guide to banana production in Tiquisate, Guatemala: Banana planting, fertilization, irrigation, in planta flower and fruit covering, disease and pest management, harvest, postharvest and fruit packing. Unpublished, bachelor thesis. ENCA, Guatemala.