

# Geological Agriculture (GeoAg)

## Green Paper

Spring 2020

Presented to the White House Initiative on HBCUs at the U.S.  
Department of Education

by

Academic Association of Geological Agriculture Research  
(AAGAR)

### ***AAGAR Member Institutions***

Faculty from: Tennessee State University, Morgan State University, Fort Valley State University, Delaware State University, Bronx Community College/CUNY, Morehouse School of Medicine, Clark Atlanta University, Savannah State University, and Medgar Evers College/CUNY



GeoAg grow cup  
10-day old broccoli sprouts

# About Academic Association of Geological Agriculture Research (AAGAR)

- Geological Agriculture (GeoAg) is the new study of cultivating vegetation in geological formations without soil or fertilizers.
- The book *River Stones Grow Plants* by Richard Campbell, MBA, with contributions from Dr. Arvazena Clardy from Tennessee State University and Dr. Henry Teng from George Washington University, outlines the history and evolution of geological agriculture.
- Campbell created To Soil Less consulting in 2009 to research and beta-test GeoAg concepts across a variety of platforms, collaborating with global academic institutions to advance the body of research.
- In 2020, Campbell and Dr. Clardy formed the AAGAR, a research collective of 20-faculty members from 9-institutions who are actively engaged in researching and refining the theories of GeoAg through on-campus research, student activities and grants.
- See list of the 9 domestic institutions, 20 faculty members and their related *GeoAg Integrated Research Area* for each scientist. The AAGAR team is available to those seeking to integrate GeoAg programming into their operations. Email us.
- AAGAR to issue research findings periodically.

*All images in this document are of plants that grew via GeoAg methodologies and theories.*

## AAGAR – Executive Committee

Chair – Dr. Arvazena Clardy, Tennessee State University  
Vice Chair – Dr. Oulare Owolabi, Morgan State University  
Secretary – Dr. Carollyn Boykins, Tennessee State University  
Founder of Geological Agriculture – Richard Campbell

### Tennessee State University

Dr. Arvazena Clardy  
*GeoAg Horticulture Plants*  
Dr. Carollyn Boykins  
*GeoAg Livestock Feed*  
Dr. Elbert Myles  
*GeoAg Cancer Research*

### Clark Atlanta University

Dr. Shonda Lawrence  
*GeoAg Societal Implications*  
Dr. Eric Mintz  
*GeoAg Chemistry*  
Professor Donald Hylton  
*GeoAg Bioplastics*

### Medgar Evers College/CUNY

Dr. Dereck Skeete  
*GeoAg Urban Environment*

### Fort Valley State University

Dr. Bipul Biswas  
*GeoAg Field Crops*  
Dr. Steven Samuels  
*GeoAg Greenhouse Crops*

### Delaware State University

Dr. Michael Casson  
*GeoAg Markets, Trade and Economy*  
Dr. Constant Beugre  
*GeoAg Business*

### Morehouse School of Medicine

Dr. Brian Rivers  
*GeoAg Cancer*

### Savannah State University

Dr. Sue Ebanks  
*GeoAg Environmental Science*

### Morgan State University

Dr. Oulare Owolabi  
*GeoAg Engineering*  
Dr. Jiangnan Peng  
*GeoAg Chemistry*  
Professor Author Willoughby  
*GeoAg Aerospace*

### Bronx Community College/CUNY

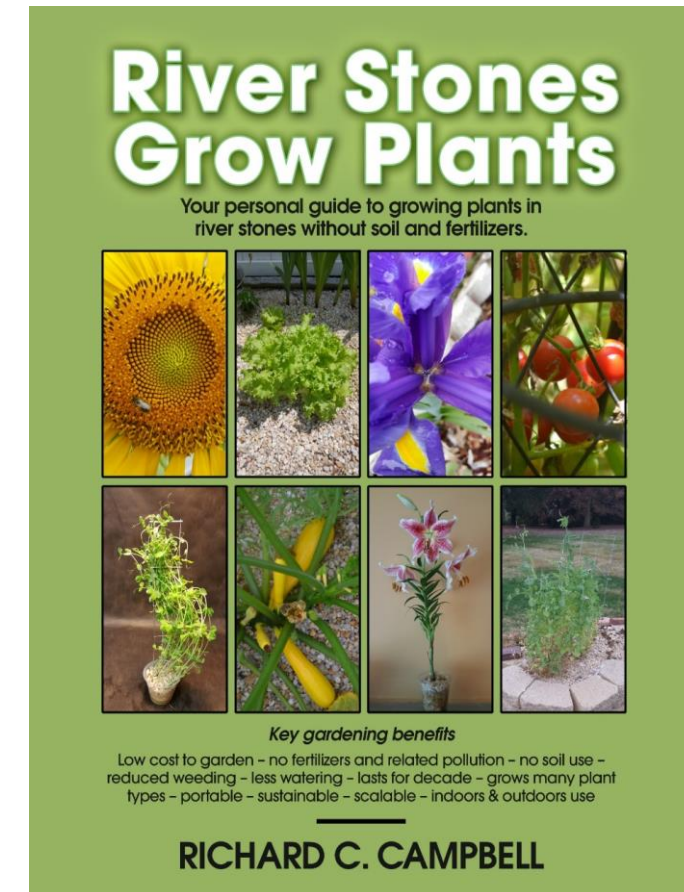
Professor Charmaine Aleong  
*GeoAg Urban Nutrition*  
Dr. Charles Maliti  
*GeoAg Human Health*  
Dr. Dickens St. Hilaire  
*GeoAg Soil Health*  
Professor Sami Segni  
*GeoAg Geology*



# About Geological Agriculture (GeoAg)

According to the book *River Stones Grow Plants* by author and inventor Richard Campbell, the full definition of geological agriculture is the study and application of cultivating vegetation to maturity, indoors or outdoors, permanently in geological formations (rocks) without the use of soil and fertilizers. Since 1994, the Campbell family and universities have reexamined rocks, identifying geo-nutrient release properties for plant cultivation. Key highlights:

- 2010** **Richard Campbell creates To Soil Less** as a tradename to share GeoAg principals and theories to academic institutions and government entities - [www.tosoilless.com](http://www.tosoilless.com).
- 2013** **Interview with Richard Campbell** - <http://www.providencejournal.com/article/20130321/News/303219986>.
- 2014** **Tennessee State University professor Dr. Arvazena Clardy** and Richard Campbell on TV News Channel 8 - <https://wjla.com/news/entertainment/a-breakthrough-in-urban-gardening-22892>.
- 2017** **Barnes and Nobles** lists the book *River Stones Grow Plants* by Richard Campbell and Dr. Arvazena Clardy - <https://www.barnesandnoble.com/w/river-stones-grow-plants-richard-campbell/1126486150>.
- 2018** **Fulton County, GA Board of Commissioners** votes to pilot GeoAg to address food deserts in the county - <http://fultoncountyga.gov/component/content/article/9177-fulton-county-board-pilots-alternative-growing-method-to-address-district-5-food-desert-challenges>.
- WTOP News** in Washington, DC interview Campbell about GeoAg - <https://wtop.com/gardening/2018/08/how-to-grow-a-garden-in-gravel/slide/1/>.
- The US State Department** invites GeoAg to the 2018 and 2019 Mandela Washington Fellows Summit in Washington, DC - <https://yali.state.gov/introduction-to-geological-agriculture/>.
- 2019** In **Lome, Togo, West Africa**, team GeoAg hosts press conference to bring GeoAg to Africa - <http://www.africardv.com/societe/geoag-pour-revolutionner-lagriculture-au-togo/>.
- 2020** **AAGAR Develops** - A collection of faculty from 9 domestic and 15 African universities collectively seek research grants to investigate GeoAg theories and methodologies.



Pea seed opening



Basil



Cucumber



# The Academic Association of GeoAg Research

The 20 faculty who have agreed to investigate geological agriculture theories, methodologies and practice make up the

**Academic Association of Geological Agriculture Research**  
as a means of collectively working together as a team on a new body of research, looking at new uses of rock.

Let's meet some of the faculty of GeoAg...



Sunflower



Cherry Tomatoes



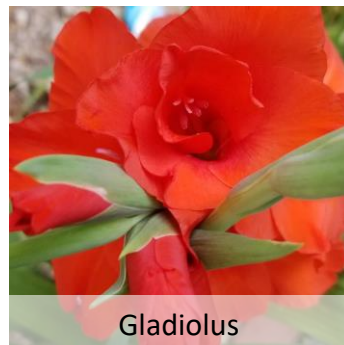
Lettuce



Begonia, Petunia, Wheatgrass, and Corn



Peas, Beans, Greens, and Wheatgrass



Gladiolus



Marigolds



Zinnia



Squash Blossom





# Tennessee State University

## Current Horticultural Programs

- International and Exotic Fruits and Vegetables and Alternative Horticultural Crops working with Small and Limited Resource producers and farmers in determining alternative crops for production (Herbs, Christmas Cactus and Vegetable production, harvesting and marketing)
- Educating producers on alternative agricultural products and development of new marketing (Herbs and Vegetables)
- TSU Community Gardens and Developing Community Gardens Statewide
- Women In Agriculture
- Outreach Programs (Small Farms and Veterans)
- Youth Development Programs:
  1. The Developing Future Scientist Program
  2. The Big Picture Mentoring
  3. School Gardens Program and School Garden Coalition

## Dr. Arvazena Clardy

Associate Professor of Horticulture  
and Extension Specialist  
4-SET and NRCS Outreach  
Coordinator

Department of Agricultural and  
Environmental Sciences  
College of Agriculture  
Tennessee State University  
3500 John A. Merritt Boulevard  
Nashville, TN 37209  
[aclardy@tnstate.edu](mailto:aclardy@tnstate.edu)  
Tel: 615-963-4887

## On Campus Geological Agriculture Activities

1. Integrating GeoAg studies in horticulture sciences classes (see photo)
2. Testing multiple plants across multiple rocks types
3. Working with students who have decided to do GeoAg as a senior thesis (see photo)
4. Introducing GeoAg to other faculty at TSU (see photo)

## Geological Agriculture Areas of Research

1. Horticulture crops
2. Microgreens
3. Food deserts
4. Extension activities





# Tennessee State University

## Professional Preparation

- B.A. – Biology – Fisk University
- M.S. – Animal Nutrition – Tennessee State University
- Ph. D. – Animal Nutrition – Ruminant Microbiology – Michigan State University

## Corporate Employment

- Purina Mills – Nutritional Consultant
- Monsanto (Bayer)
- Archer Daniels Midland – Technical Services Director

**Dr. Carollyn Boykins - Winrow**  
Assistant Professor of Animal  
Science and Academic Coordinator,  
Animal Science/Food Science  
Department of Agricultural and  
Environmental Sciences  
College of Agriculture

Tennessee State University  
3500 John A. Merritt Boulevard  
Nashville, TN 37209  
[cboykins@tnstate.edu](mailto:cboykins@tnstate.edu)  
Tel: 615-963-7496

## On Campus Geological Agriculture Activities

- Development of theoretical GeoAg livestock feed designs, protocols and methodologies
- Investigation of multiple livestock feed crops including sorghum, cowpea and buckwheat (see photos)
- Seeking grants related to GeoAg integrated with Animal sciences

## Geological Agriculture Area of Research

1. Animal production & nutrition
2. Ruminant nutrition & digestive physiology
3. Custom GeoAg Feeding troughs for livestock



# Morgan State University

## Background

- Actively involved in planning, designing, supervising, and constructing many civil engineering projects, including a \$70 million water supply program
- Engaged in a World Bank-sponsored study of capacity loss and maintenance implications of local and state roads
- Development of two graduate courses in Infrastructure Studies at Morgan State University

## Research Interest

1. Pavement engineering, 2. Sustainable infrastructure development, 3. Soil mechanics, 4. physical and numerical modeling of soil structures, 5. Computational geo-mechanics, 6) Geo-structural systems analysis, structural mechanics, and material model development

## Synergistic Activities

- Conference General Chair - World Scientific and Engineering Academy and Society (WSEAS) International Conferences - Baltimore - 2013 and at Cambridge, MA – 2014
- Developed: 1. a powerful and accurate computational tools in engineering mechanics & 2. a cost-effective pavement procedure based on mechanistic approach as in contrast to popular empirical approaches for tropical regions - George Washington University – 2007

## On Campus Geological Agriculture Activities

- Showcased GeoAg at on campus International Engineering Conference (see photo)
- Developed theoretical GeoAg engineering platforms for improved irrigation and agri-engineering systems
- Investigating GeoAg engineering application in aerospace, bioproducts and geo-release home systems

## Geological Agriculture Area of Research

1. Civil and Mechanical Engineering
2. Bioproducts Engineering
3. Aerospace Engineering
4. International Development



**Dr. Oludare Owolabi Sc., P.E.**

Faculty, and Associate Chair of  
Department of Civil Engineering  
Assistant Director of the Center  
for Advanced Transportation  
and Infrastructure Engineering  
Research (CATIER) as well as the  
Director of the Undergraduate  
Geotechnical Laboratory  
Department of Civil Engineering

Morgan State University  
1700 E Cold Spring Ln  
Baltimore, MD 21251

[Oludare.owolabi@morgan.edu](mailto:Oludare.owolabi@morgan.edu)

Tel: 443-885-5445





# Morgan State University

## Current Research Programs

Research interests focus on the identification and analysis of bioactive components from natural resources, including plants, fungi, microbes, and marine invertebrates. Active research programs include:

- Discovery of new drug leads from natural resources for the treatment of human diseases such as cancer and infectious diseases
- Investigation of the scientific basis of dietary supplements and herb medicines
- Development of new botanical drugs

## Key Highlights

- Authored a total of 94 Selected Publications
- Patent holder of 3 products
- Senior ORISE Fellow, Pharmaceutical Analysis Branch I, FDA/CDER/OPQ/OTR

## Professional Preparation

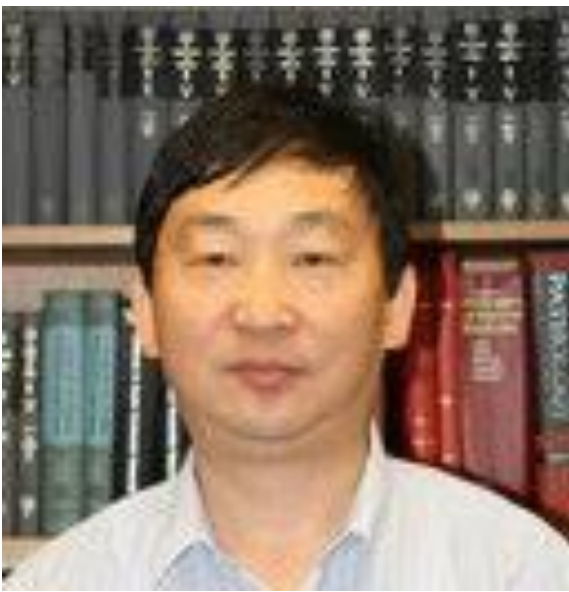
- Postdoctoral fellow, Natural Product Chemistry - University of Mississippi
- Ph. D. Natural Product Chemistry - Chinese Academy of Medical Sciences & Peking Union Medical College
- M.S. Natural Product Chemistry - Beijing University of Chinese Medicine

## On Campus Geological Agriculture Activities

- Conducted rocks vs soil preliminary microgreens investigation - (see photo)
- Assessed the consistency of GeoAg beans across of simple set of 30 samples – (see photo)
- Investigating GeoAg engineering application in aerospace, bioproducts and geo-release home systems

## Geological Agriculture Area of Research

1. Sulforaphane Research
2. Chemistry of Bioproducts
3. Greenhouse Research
4. International Development



**Dr. Jiangnan Peng**

Assistant Professor, Department  
of Chemistry  
School of Computer,  
Mathematical and Natural  
Sciences

Morgan State University  
1700 E. Cold Spring Lane  
Baltimore, MD 21251

[Jiangnan.peng@morgan.edu](mailto:Jiangnan.peng@morgan.edu)

Tel: 443-885-3955



# Morgan State University

## Professional Preparation

- DoD Cyber Incident Analyst/Global Threat Analyst/ISSO/ISSM (Information Systems Security Officer/ Manager) -March 1984 – Present
- Princeton University Professor – May 2014 – Sept. 2014
- General Dynamics – DoD War Gaming Modeling Scenario Manager / DoD Chief Scientist / Import Export Controls Manager - June 2009 – July 2010
- The Johns Hopkins University APL – Engineer, Mechanical Engineer, Applied Mathematics - January 2006 – January 2008
- NASA Goddard Space Flight Center – Aerospace Engineer – Sounding Rockets - June 1980 – June 1983

## Synergistic Activities

Numerous training in the hard sciences which include the following:

Computational Fluid Dynamics (CFX, MARC, STARDYNE, GIST, GIFT, NASTRAN, ANSYS, FEMAP, STRUDL, GTSTRUDL, GASP, FLOTRAN, FLUENT), STK (Satellite Tool Kit), Math lab (Mathematical Library), MATH CAD, MAPLE, SAS (Statistical Analysis Software), Data Mining, Unigraphics, Geo-Cad COMPUTERVISION, Geo-Cad, Pro-Engineer, AUTOCAD, Versa Cad, Micro station, Lisp Expert Language, GIS ARCVIEW (ARCCAD, ARC-Info, CRAMM, COBRA, Risk watch, VISIO,ISSO (Information Systems Security Officer) Training, ISSM , and EXPORT CONTROL

CLEARANCE: TS/SCI with a Full Scope Polygraph (Active)

## On-Campus Geological Agriculture Activities

- Coordinated interface between GeoAg and School of Engineering at Morgan State University
- Developed theoretical GeoAg aerospace designs for astronauts on the ISS and in biodomes in outer space
- Integrated aerospace colleague Dr. Eric Sheppard former Dean of Engineering at Hampton University on a GeoAg aerospace grant application in 2020

## Geological Agriculture Area of Research

1. Aerospace Engineering
2. GeoAg Systems for Aeronautical Sciences



**Dr. Arthur Neal Willoughby**

Aerospace Assistant Professor  
Department of Civil Engineering

Morgan State University

Baltimore, MD 21251

[arthur.willoughby@morgan.edu](mailto:arthur.willoughby@morgan.edu)

Tel: 443-885-4238

# Morehouse School of Medicine

## Honors & Awards

- Chair-Elect, Minorities in Cancer Research Council, American Association for Cancer Research (AACR)
- Council Member, National Advisory Council on Minority Health and Health Disparities, National Institute on Minority Health and Health Disparities, NIH
- "Division of Population Science 2014 Award for Outstanding Faculty Performance" in Health Outcomes & Behavior
- Health Disparities Scholar, NIH National Institutes on Minority Health and Health Disparities Loan Repayment Program
- National Cancer Institute research grant awardee of over \$2M
- Authored nearly 30 publications

## Research Interest

Community-based participatory research, cancer health disparities, mobile health, integrated biological and behavioral science

## On Campus Geological Agriculture Activities

- Development of theoretical GeoAg applications in health prevention and treatments
- Seeking grants related to GeoAg and cancer research

## Geological Agriculture Area of Research

1. GeoAg and Integrated Health Sciences
2. GeoAg and Cancer Research



**Dr. Brian Rivers, M.P.H.**

Director  
Cancer Health Equity Institute

Morehouse School of Medicine  
720 Westview Drive  
Atlanta, GA 30310  
[brivers@msm.edu](mailto:brivers@msm.edu)  
Tel: 404-752-1127



# Fort Valley State University



**Dr. Bipul K. Biswas**

Assistant Professor of Graduate  
Biotechnology, Specialty Plants  
Biotechnology Research  
Agriculture, Family Sciences and  
Technology  
Agricultural Sciences Academic  
Department

Fort Valley State University  
1005 State University Dr.  
Fort Valley, GA 31030-4313  
[biswasb@fvsu.edu](mailto:biswasb@fvsu.edu)  
Tel: 478-825-6827

## Area of Research

1. Conducting research on 'Specialty Plants/'Bioactive Plants', Peach research for short life (PTSL) study
2. Stevia research in Georgia, Urban Agriculture/Hydroponics study, Developing Hi-Tech Farming/'Agbot', using Tissue culture and Chromatography/HPLC
3. Employing plant biotechnology/tissue culture, genetic engineering molecular markers, agronomic trial, and breeding techniques to improve plant's yield, disease tolerant, cold, drought and water resistant using plants germplasm
4. Investigating plant products/phytochemicals for selecting high yielding plant through TLC, and HPLC

## Honors & Awards

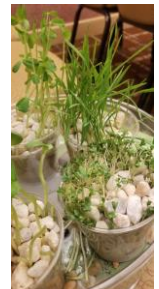
1. Awarded USDA grants over \$2 million as Co-Project director – 2004 – present
2. USDA Postdoctoral Fellowship
3. Speaker at American Society for Horticultural Science Annual Conference - 2019
4. Recipient of the "Faculty New Researcher of the Year" Award – 2008
5. Invited Speaker Award for In Vitro Biology Annual Conference in San Francisco, CA – 2004

## On Campus Geological Agriculture Activities

- Shared GeoAg at the 1890s Land Grant Research Symposium in 2018 (see photos)
- Conducted a rock geo-nutrient release test for rocks from the United States and Africa (see photo)
- Seeking grants to support area farmers, investigate field crops and a variety of specialty crops

## Geological Agriculture Area of Research

1. Field Crops
2. Small and Mid-Size Farms
3. Geo-Nutrient Release





# Fort Valley State University

## Professional Experience

Tuskegee University - Research assistant  
Georgia State University - former Assistant professor

## Publications

16 Publications, including:

- 2015 – In-Planta Expression of Synthetic Lytic Peptides for the Potential Immune of Human Immunodeficiency Virus Replication
- 2009 - Expression of Synthetic Tumor Reducing Peptide Genes in Sweet Potato as Therapeutic Drugs Against Cancer

## Honors & Awards

1. Dr. Steven Samuels is using a \$100,000 Specialty Crop Block Grant to aid in their project, “Optimizing Cultivation Practices to Develop Turmeric Production in Georgia.” This is a three-year grant (ending September 2022) awarded by the U.S. Department of Agriculture’s (USDA) Agricultural Marketing Service (AMS).
2. USDA National Institute of Food and Agriculture featured article - Improving Health Through Stevia Research

## On Campus Geological Agriculture Activities

- Conducted GeoAg plant cultivation test on stevia, beans, wheatgrass and peas (see photo)
- Conducted a GeoAg vs Soil test for bean, testing full growth cycle to maturity.
- Conducted first GeoAg cloning experiment with stevia (see photo)

## Geological Agriculture Area of Research

1. Greenhouse & Field Crops
2. Small and Mid-Size Farms
3. Specialty Crops – Stevia, Sweet Potatoes, Beans.



## Dr. Steven Samuels

Ag Research Professional  
Agriculture, Family Sciences and  
Technology  
Agricultural Sciences Academic  
Department

Fort Valley State University  
1005 State University Dr.  
Fort Valley, GA 31030-4313  
[steven.samuels@fvsu.edu](mailto:steven.samuels@fvsu.edu)  
Tel: 478-827-3134





**Dr. Dickens Saint Hilaire**

Assistant Professor  
Department of Chemistry, Earth  
Sciences and Environmental  
Sciences

Bronx Community College / CUNY  
2155 University Avenue  
Bronx, NY 10453  
[dickens.st\\_hilaire@bcc.cuny.edu](mailto:dickens.st_hilaire@bcc.cuny.edu)  
Tel: 718-289-5000

# CUNY – Bronx Community College

## Professional Preparation

- Ph. D. – Chemistry – City College of the City University of New York – 2011
- M.A. – Chemistry – City College of the City University of New York – 2003
- B.Sc. – Chemistry – City College of the City University of New York – 2001

## Synergistic Activities

- Use knowledge and information from Picarro as a teaching tool
- Use knowledge and information from weather station as teaching tool
- Development of the Environmental Science course at Bronx Community College

## 10 Publications, including:

- Saint-Hilaire D, Ismail KZ, Jans Urs, “Reaction of tris(2-chloroethylphosphate) with reduced sulfur species”. Chemosphere, 83 (7):941-7, 2011
- Saint-Hilaire D, Jans U. “Reaction of three halogenated organophosphorus flame retardants with reduced sulfur species”. Chemosphere, 93(9), 2033-9, 2013

## On Campus Geological Agriculture Activities

- Participated in dedicated GeoAg faculty focused training session with founder Richard Campbell
- Developed theoretical GeoAg models for GeoAg soil health methodologies
- Investigating Geo-nutrient release rates, properties and characteristics
- Coordinated Richard Campbell to speak to Chemistry Department at BCC/CUNY (see photo)

## Geological Agriculture Area of Research

- Urban environmental science
- GeoAg soil health research
- Geo-chemistry investigations



# Bronx Community College/CUNY

## Current Nutrition Research

### *Publications*

- Reader, S., & Aleong, C. – A pilot study of a cross-sector partnership to integrate inner-city community college students into a school-based health promotion program. *Californian Journal of Health Promotion*, 15(2), 81-88 – 2017
- Aleong, C., – A Complimentary Teaching Activity for Food Security and Healthy Eating Behavior Change in a Community College. *Hispanic Educational Technology Services Journal*, Vol 1X fall – 2018

### *Synergistic Activities*

- Former Master gardener with Cornell University Cooperative Extension for 10 years
- Dietetics & Nutrition Curriculum Coordinator – Conduct student advisement on careers and academic transfer – 2007 – present
- Faculty Advisor to Bronx Community College Food & Garden Club – Conduct weekly workshops on healthy meal preparation for students. Seasonally, oversee students in planting, tending, and harvesting vegetables in an on-campus garden – 2010 – present
- Campus Diabetes Coordinator – Provided up to date information and activities for students and faculty on diabetes – 2012 -2015



## **Professor Charmaine Aleong RN, RD, MS, MSN**

Dietetics & Nutrition Curriculum Coordinator - Professor  
Department of Health, Physical Education & Recreation

Bronx Community College  
2155 University Avenue,  
Bronx, New York 10453  
[Charmaine.aleong@bcc.cuny.edu](mailto:Charmaine.aleong@bcc.cuny.edu)  
Tel: 718-289-5048

## **On Campus Geological Agriculture Activities**

1. Integrated GeoAg studies in student cook-shop classes on Thursdays in the spring of 2020 (see photo)
2. Growing GeoAg plants in weekly cook-shop laboratory (see photo)
3. Filming Campbell teaching during in-class GeoAg activity to nutrition science students
4. Participated in GeoAg outreach event with the Bronx School Board
5. Introduced GeoAg to other faculty at BCC and colleges in the CUNY network, including Medgar Evers College and LaGuardia Community College (see photo)

## **Geological Agriculture Area of Research**

1. Nutrition Sciences
2. Urban Nutrition
3. Food Deserts







**Sami M Segni, M.S.**

Adjunct/Sub Lecturer  
Department of Chemistry, Earth  
Sciences, and Environmental  
Sciences

Bronx Community College / CUNY  
2155 University Avenue  
Bronx, NY 10453  
[sami.segni@bcc.cuny.edu](mailto:sami.segni@bcc.cuny.edu)  
Tel: 718-289-5569

# Bronx Community College / CUNY

## Professional Preparation

B.A. – Physics – Faculte de Tunis II, Tunisia – 1999

M.A. – Geology – The City College of New York, CUNY – 2006

## Awards

- Certificate of Professional Excellence, STEM - Institute-City College, CCNY
- Nobelium Price – Demonstrator at the Annual National Chemistry - 2017
- Certificate of Honor – Demonstrator at the Annual National Chemistry Week Program - 2017, 2018 & 2019

**Invention:** Developed a model named “Solar Elevation Angle at Noon, “SEAN” that is a useful tool to easily determine the solar elevation angle

**Courses Taught:** Earth System Science, Global Environmental Hazards, The Dynamic Earth, The Atmosphere, Perspectives of Global Warming, Systems Analysis of Earth, Physical Sciences

## On Campus Geological Agriculture Activities

- Participated in dedicated GeoAg faculty focused training session with founder Richard Campbell
- Hosted over seven dedicated GeoAg training conference calls to assess and investigate GeoAg theories
- Developed theoretical GeoAg models for geo-nutrient release protocols, urban environment green space to address the “heat island” effect and geo-enhancing models for soil quality improvements

## Geological Agriculture Area of Research

- Geological measure and ratings of GeoAg research
- Urban environmental science
- GeoAg soil health research

# Delaware State University

## Current Programs

- PI of U.S. Virgin Islands GIS Asset Mapping project funded by the U.S. Economic Development Administration
- President and Co-Founder of the Delaware Multicultural and Civic Organization (DEMCO)
- Founding Director and Principal Investigator (PI) of the Delaware State University Center for Economic Development and International Trade (UCEDIT)
- Served as the Interim Dean of Graduate Studies, the Interim Chair of the Department of Accounting, Economics and Finance – US Department of Commerce Award
- Co-PI and lead economist for USAID's West Africa Analytical Support Services and Evaluations for Sustainable Systems (ASSESS) program in Agriculture, Environment, Energy and Trade- supporting economic development for twenty-one Western African countries

## ***Authored over 15 publications and commissioned reports; including:***

- “Geographical Information Systems United States Virgin Islands Asset Map” – 2017
- “African American Small Business and Workforce Inclusion Study” – 2016
- “Trade Hub Analysis of ECOWAS Region of Western Africa” – 2014
- “Market and Feasibility Report – Garrison Technology Park” – 2013
- “The Economic Impact of Delaware State University on Kent County and the State of Delaware” – 2004 and 2014

## On Campus Geological Agriculture Activities

- Development of theoretical GeoAg application in business settings
- Seeking grants related to GeoAg integrated Markets, Trade and the Economy

## Geological Agriculture Area of Research

1. Business Markets
2. International Development



**Dr. Michael H. Casson Jr.**

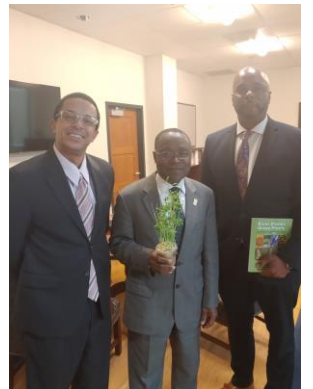
Interim Dean of the College of Business

Director of University Center for Economic Development and International Trade (UCEDIT)  
Director of Economic Development and Leadership Institute (EDLI)

Delaware State University  
1200 N. DuPont Highway  
Dover, DE 19901

[mcasson@desu.edu](mailto:mcasson@desu.edu)

Tel: 302-857-6900





# Delaware State University

## Research Interest

Entrepreneurial Creativity, Entrepreneurial Ecosystems, Organizational Neuroscience.

## Skills and Experience

Has published seven books and more than fifty refereed journal articles, book chapters, and conference proceedings

## Honors & Awards:

- Fulbright Scholar – 2014
- Visiting Fellow at Harvard University

## On Campus Geological Agriculture Activities

- Engage prospective entrepreneurs in establishing startups to promote urban agriculture based on GeoAg practices
- Develop a program in the College of Business to train individuals to apply GeoAg practices
- Include GeoAg in the development of an entrepreneurial ecosystem at Delaware State University starting with the Garage, the business incubator of the College of Business
- Train farmers in the application of GeoAg practices
- Promote the development of GeoAg practices in Ivory Coast and elsewhere in Africa

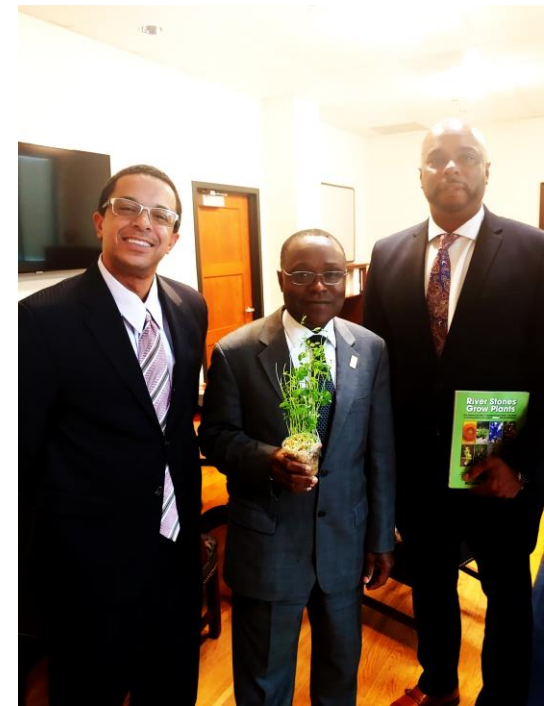
## Geological Agriculture Area of Research

- |                                 |                               |
|---------------------------------|-------------------------------|
| 1. Entrepreneurial Ecosystems   | 3. Entrepreneurial Creativity |
| 2. Economics, Markets and Trade | 4. Rural Development          |



**Dr. Constant D. Beugré**  
Professor of Management  
College of Business

Delaware State University  
1200 N. Dupont Hwy  
Dover, DE 19904  
[cbeugre@desu.edu](mailto:cbeugre@desu.edu)  
Tel: 302-857-6926



# Clark Atlanta University

## Background

- Scientist and Engineer In the Plastics Industry - Society of Plastics Engineers Inc.
- Chairman of Subcommittee – ASTM
- Principal Investigator - High Performance Polymers and Composite Center
- Pioneer In the Development of Polypropylene Products - Exxon Mobil Corporation

## On Campus Geological Agriculture Activities

- Development of theoretical GeoAg bioplastics applications
- Seeking grants related to GeoAg polymer testing

## Geological Agriculture Area of Research

1. GeoAg Bioplastic Polymers
2. GeoAg Polymer Related Materials Testing



## Dr. Donald Hylton

Senior Research Scientist  
Department of Chemistry

Clark Atlanta University  
223 James P Brawley Drive  
Southwest  
Atlanta, Georgia, 30314  
[dhylton@cau.edu](mailto:dhylton@cau.edu)  
Tel: (404) 880-8000



# Clark Atlanta University

Dr. Lawrence serves as a Commissioner on the Membership and Professional Development Commission (CMPD)

## Professional Preparation

- Ph.D. – Social Work – University of Illinois at Chicago, Jane Addams College of Social Work
- M.S. – Criminal Justice in Corrections/Criminal Justice – Chicago State University

## Research Areas

- Child Welfare
- Incarcerated Populations
- Incarcerated Women and HIV
- Homeless and Contagious Diseases

## Key Articles

- Tuberculosis Containment among the Homeless in Metropolitan Jackson, Mississippi
- Serving Incarcerated Mothers and their Babies in Community-Based Residences

## On Campus Geological Agriculture Activities

- Development of theoretical GeoAg societal implications
- Seeking grants related to GeoAg and social impact

## Geological Agriculture Area of Research

1. Social Implications of GeoAg
2. GeoAg and Social Work



### Dr. Shonda Lawrence

Associate Professor  
BSW Program Director  
Whitney M Young Jr. School of  
Social Work

Clark Atlanta University  
223 James P. Brawley Dr., SW  
Atlanta, GA 30314  
[slawrence@cau.edu](mailto:slawrence@cau.edu)  
Tel: 404-880-6732



# Savannah State University

## Current Programs

- Represent Savannah State University in 4 national/regional Earth Science-related studies
- Assisted in the development of a K-12 Ocean Science Curriculum to strengthen the pathway
- Active leader for the National Association of Marine Laboratories Education Committee
- Planned/co-planned SSU participation in 30+ community outreach activities related to Earth Sciences Education
- Recipient of awarded and pending grants totaling over \$1M

## Grant awardee of:

- National Science Foundation
- US Dept. of Commerce
- US Dept. of Agriculture-National Institute of Food and Agriculture (USDA-NIFA)

## On Campus Geological Agriculture Activities

- Development of theoretical GeoAg marine and environmental science perspectives
- Development of theoretical GeoAg application in Savannah's food desert, minority and inner city environments
- Seeking grants related to GeoAg integrated with urban environmental science

## Geological Agriculture Area of Research

1. Urban environmental science
2. Marine and environmental science

### Dr. Sue Ebanks

Associate Professor  
Department of Marine and  
Environmental Sciences

Savannah State University  
3219 College St.  
Savannah, GA 31404  
[ebankss@savannahstate.edu](mailto:ebankss@savannahstate.edu)  
Tel: 912-358-4430





Peas and Cucumbers



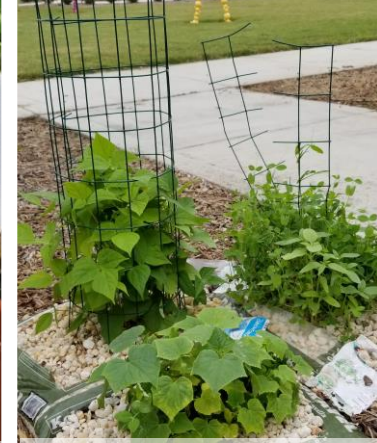
Wheatgrass



String Beans



Broccoli Sprouts



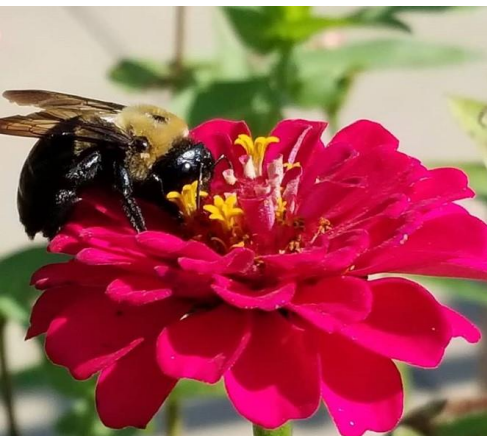
Cucumbers



Iris

# Geological Agriculture

## Gallery of Research Plants



Zinnia



Microgreens



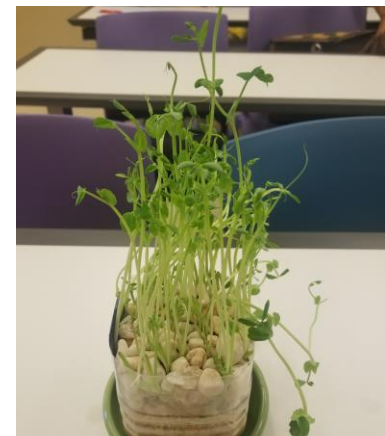
Tulip



Mums



Microgreens



Pea Sprouts



# AAGAR CONTACT INFORMATION

## AAGAR - CHAIR

**Arvazena Clardy, Ph.D.**

Associate Professor of Horticulture  
and Extension Specialist

4-SET and NRCS Outreach  
Coordinator

Department of Agricultural and  
Environmental Sciences  
College of Agriculture

Tennessee State University  
3500 John A. Merritt Boulevard  
Nashville, TN 37209  
615-963-4887  
[aclardy@tnstate.edu](mailto:aclardy@tnstate.edu)

## AAGAR – VICE CHAIR

**Oludare Owolabi, D. Sc., P.E.**

Assistant Director of the Center for  
Advanced Transportation and  
Infrastructure Engineering Research  
(CATIER) as well as the Director of the  
Undergraduate Geotechnical  
Laboratory  
Department of Civil Engineering

Morgan State University  
1700 East Cold Spring Lane Baltimore,  
Maryland 21251  
443-885-5445  
[Oludare.owolabi@morgan.edu](mailto:Oludare.owolabi@morgan.edu)

## AAGAR - FOUNDER

**Richard Campbell, MBA**

President of To Soil Less  
Founder of Geological Agriculture  
To Soil Less Consulting  
[www.tosoilless.com](http://www.tosoilless.com)  
Ellicott City, MD  
202-689-9096  
[richardcampbell2010@gmail.com](mailto:richardcampbell2010@gmail.com)

**Aaron Short**

President  
K.E.E.P. Inc Foundation  
Official GeoAg Non-Profit  
[www.keep-inc.org](http://www.keep-inc.org)  
[GeoAgResearch@keep-inc.org](mailto:GeoAgResearch@keep-inc.org)