



GACSA ACTION GROUPS

GACSA Annual Forum, May 4, 2023

Action Group Co-Leads:

Ernie Shea, Solutions from the Land & North American CSA Alliance

Allison Chatrchyan, Cornell University

Rosa Mosquera, University de Santiago de Compostela

Agenda in Brief

14:30 Opening comments/Welcome/Objectives: Ernie Shea

14:40 Case Study Presentations:

- Knowledge Action Group:

- University Initiative: CSA and Soil Health Programs in NY: Dr. Allison Chatrchyan, Cornell
- Business Initiative: 4R Nutrient Stewardship Program in Africa: Dr. Shamie Zingore, African Plant Nutrition Institute
- NGO Initiative: Armenian Cover Crop & Soil Health Initiative in Armenia: Artak Khachatryan,

- Investment Action Group: Government Initiative: CSA Investments for Farmers (USA): Terry Cosby, USDA

- Enabling Action Group: Dr. Rosa Mosquera, University de Santiago de Compostela, Spain

15:20 Breakout Room Sessions:

- What do you need to scale up the adoption of CSA systems and practices like the ones we just heard about?
- How can GACSA help facilitate/support these efforts in your country/organization?

15:45 Reports from Breakout Groups (2 min each)

16:00 Close and Challenge to GACSA Members: Ernie Shea

GACSA ACTION GROUPS OVERVIEW: Ernie Shea

The **Knowledge Action Group (KAG)** works to increase and promote knowledge, research, and development into technologies, practices, and policy approaches for CSA. In particular, KAG functions are:

- Increasing and promoting knowledge, research and development into technologies, practices, and policy approaches for climate-smart agriculture; practices and technology sharing and cooperation; improving communication and information sharing among participants; and outreach, extension, and technical assistance.

The **Enabling Environment Action Group (EEAG)** works to identify the technical, policy and investment conditions needed to scale up Climate-Smart Agriculture (CSA) approaches, and to promote the harmonization of community-based national agriculture, climate change and food system policies.

- In particular, the EEAG functions are: integrating climate-smart agriculture into policy, strategies and planning at regional, national, and local levels and across landscapes.

The **Investment Action Group (IAG)** functions are:

- Improving the effectiveness of public and private investments that support the three pillars of climate-smart agriculture



Climate Smart Farming

Applied Research, Resiliency, and Soil Health Initiatives

Allison Chatrchyan, Deborah Aller, Jenna Walczak, Emily Lindback
Cornell University & Cornell Cooperative Extension

climatesmartfarming.org
newyorksoilhealth.org



Climate Impacts: Extreme Precipitation



"A normal season does not seem like it happens any more. It's either really dry, or really wet. It seems like when we get rain, it's apocalyptic...We got 5 inches of rain in about 1.5 hours, and I had a lot of soil loss...I see the impact for generations."

– Thor Oechsner, Oechsner Farms,

Newfield, NY

<http://climatesmartfarming.org/videos/oechsner-farm/>



Cornell Climate Smart Farming Program

- Working toward resilient and sustainable agricultural, ecological, and social systems in the face of a rapidly changing climate
- Launched Cornell Climate Smart Farming (CSF) Program and CSF Extension Team in 2015



[Climatesmartfarming.org](http://climatesmartfarming.org)

Cornell Climate Smart Farming Website



Applied Research, Decision Tools, Resources, Extension & Education, Partnerships
www.climatesmartfarming.org



CSF Extension Team:

- Working with Farmers in NYS
- Expertise in agriculture resiliency & stewardship, dairy management, field crops, fruit crops, berries, and grapes, soil health, vegetables, & viticulture



Elizabeth Buck



Lindsay Ferito



Janice Degri



Emily Lindback

<http://climatesmartfarming.org/climate-smart-farming-extension-team/>



Laura McDermott



Kitty Ornel



Jen Russo



Erik Smith



Jenna WWC28k

Harvest NY Ag Climate Resiliency Team

Two extension agents with 100% time committed to working on climate change mitigation, adaptation, and resiliency in New York State agriculture

TOPICS

- Improving farm resilience
- Preparing for extreme weather events
- Reducing GHG emissions
- Sequestering carbon
- Funding, grants, & incentives

EDUCATIONAL METHODS

- Presentations
- Factsheets & articles
- Farm visits
- Webinars & field days

Current Location:
Hamilton, NY 13346
[Change Location](#)

Soil Water Capacity
Medium (Loam, m)

Crop Type
Grass Reference

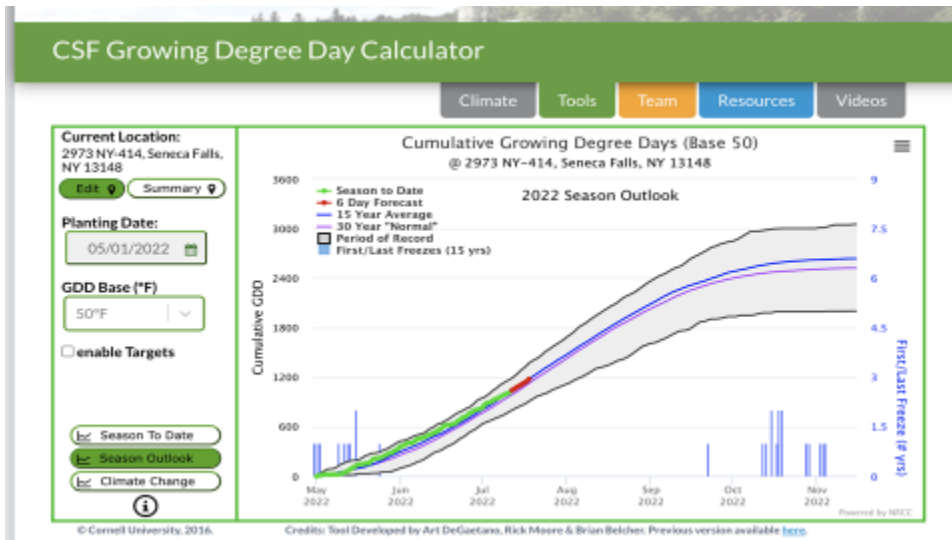
Planting/Budbreak
04/05/2017

Last Irrigation Date
NONE

[Season to Date](#)
[30-Day Outlook](#)
[Climate Change](#)
[Info](#)

CSF Decision Tools

- Data (Northeast Regional Climate Center at Cornell (NOAA):
 - 4X4 KM gridded climate data
 - NWS forecasts
 - Agricultural models
- Farmer Input:
 - Location: Any farm location in NE, WVA to ME, save multiple locations
 - Planting Date, Crop
 - Choose Season to Date, Last Season, Seasonal Outlook
 - Climate Change Context
 - Info: Meta Data behind the tools



Climate Change and Agriculture Impacts Assessment



In partnership with leading academic institutions, science organizations, community leaders, and others, New York State is undertaking a comprehensive research effort to better understand and document how climate change is affecting our state, what future impacts may be, and how we can prepare for them.

The New York State Climate Impacts Assessment development effort was launched in June 2021 and is scheduled to be completed by early 2023. [Read the launch announcement here.](#)

<https://nysclimateimpacts.org/>

New York Soil Health and Resiliency Program

Supports Healthy Food, Profitable Farms, and a Better Environment



- Advancing soil health management for sustainable agriculture and meeting the state's climate mitigation and water quality goals
- Field research on cover cropping, tillage, and carbon management, as well as new techniques for assessing soil health
- Coordination of outreach activities and training events across the state that support knowledge-based programs and services

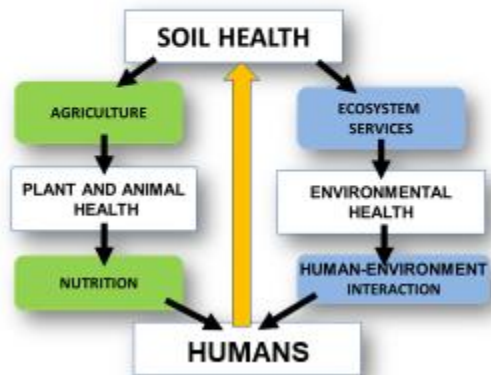
<https://www.newyorksoilhealth.org/>

Importance of Soil Health

Soils sustain terrestrial life and are the foundation of our food system



Soil health:
well-being and
ability to function...



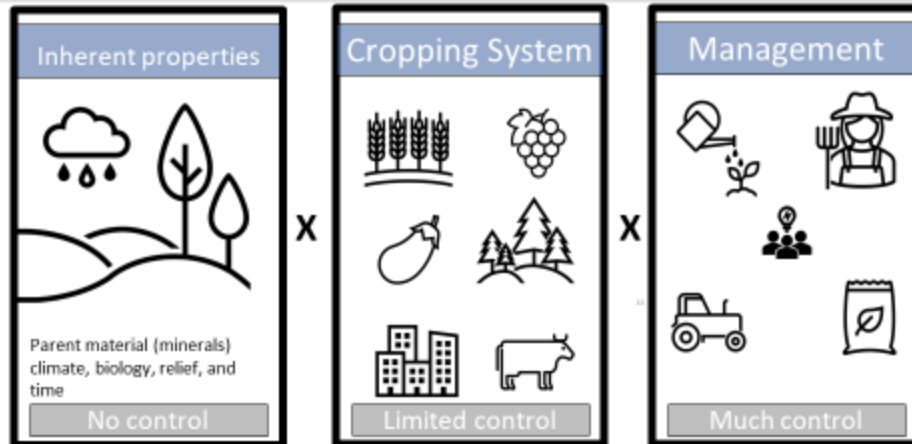
NYS Soil Health and Climate Resiliency Act (2021)

- The Act helps farmers mitigate and adapt to the impacts of climate change, by applying sustainable soil and crop management strategies that improve farm resilience and benefit the environment.
- Codifies an existing program that aims to encourage, assist and train the state's farmers in improving soil through better practices.

"Healthy soil produces healthier foods, mitigates climate change through carbon sequestration and protects our natural resources." – Donna Lupardo (Assemblymember)



Factors that impact Soil Health



Comprehensive Assessment of Soil Health



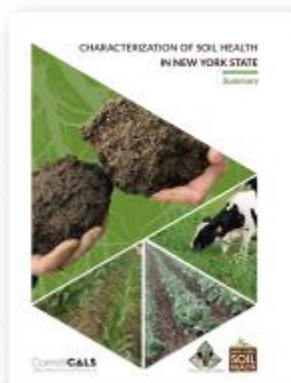
- Soil health laboratory launched in 2006
- CASH test captures all important soil processes (physical, biological, chemical)
- Focus on
 - o Practical soil health testing services
 - o Interprets measured values
 - o Identifies soil constraints
 - o Guidance for management
- 32,000+ samples processed, 20,000 over the past five years



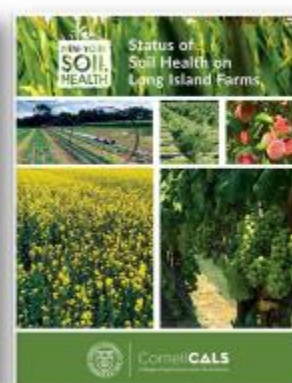
Status of Soil Health: New York State and Long Island



- First statewide and regional characterization reports
- Document current status of soil health on farmland statewide and in Suffolk County, Long Island
- Recognize distinct production environments



Amsili et al., 2020



Aller et al., 2022

Soil Health and Climate Resiliency Field Day Series 2022



Cornell University.

Thank you!

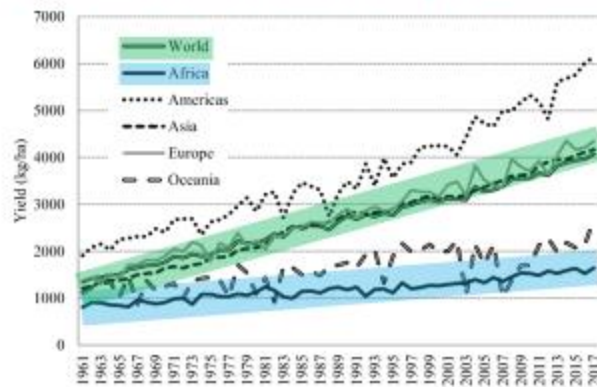
Allison Chatrchyan, amc256@cornell.edu
Deborah Aller, da352@cornell.edu



Africa 4R Nutrient Stewardship Program

Shamie Zingore | Director for Research, APNI | s.zingore@apni.net

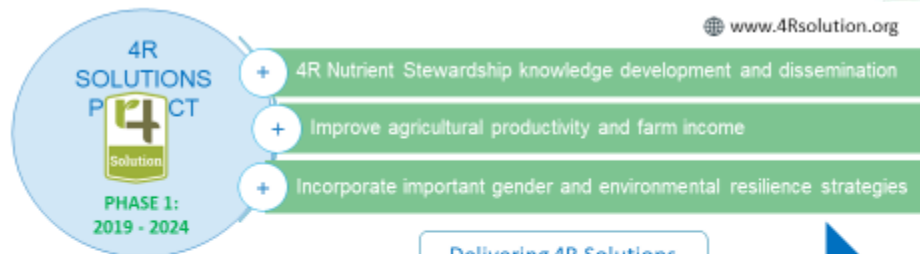
Urgent need to increase crop productivity and reverse land degradation in Africa



- Increased nutrient application
- Efficient and effective nutrient use

4R Nutrient Stewardship Framework

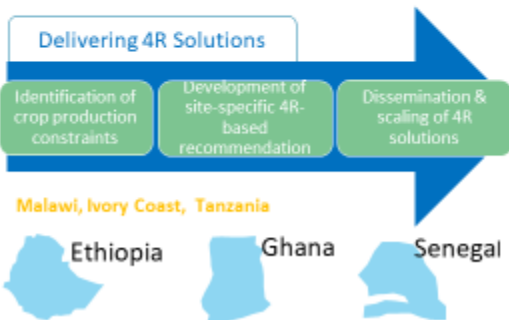
- Relevant to each of the six actions of responsible plant nutrition, with a critical role for integrated farm management.
- Connected to performance outcomes.
- Global recognition.
- Site-specific application.



Funded by Global Affairs Canada to improve the livelihoods of 80,000 smallholder farmers.

PHASE 2:
2024 - 2029

IMPLEMENTING PARTNERS



Knowledge dissemination and capacity building

Digital training program

Extension resources



<https://www.apni.net/e-learning/>



Thank you!

Shamie Zingore
Director for Research, APNI
s.zingore@apni.net

Climate-Smart Agriculture
Demonstration Project



SCALING UP COVER CROP & SOIL
HEALTH PRACTICES IN ARMENIA

ARTAK KHACHATRYAN

CSA in Armenia: Background & Context

- One of the oldest countries in the world
- Agriculture critical to the economy, 30% of Armenians who work in the agriculture sector
- Extremely vulnerable to climate change
- Extreme heat events (above 40DC) are happening almost every year and lasting 10-15 days in the fertile Ararat Valley where most vegetables and apricots are grown.
- Small scale Farmers face increasing drought and lack of adequate water, compounding other difficult economic and social challenges.
- There is a need for applied research, outreach & demonstration projects to increase adoption of CSA practices



Demonstration Site #1, Ararat: Spring, 2021



Demonstration Site #1, Ararat: Spring, 2023



Demonstration Site #2, Areguni: Spring 2023



Planted Varieties of Cover Crops

- Perennial Ryegrass:
 - Zycica trwała (MAJA) 20%
- Italian Ryegrass:
 - Życica wielokwiatowa (TRUTETRA) 15%
- Festuca:
 - Kostrzewa czerwona (REDA) 20%
- Lolium multiflorum:
 - Lam. ssp. Alternativum (KOGA) 35%

Extension and Educational Outreach





Thank you!

Artak Khachatryan, Blejan NGO

Akhachatryan2@gmail.com

CSA Initiatives, Partnerships &
Policies led by the
University de Santiago de Compostela

**GACSA Enabling Environment
Working Group**

Maria Rosa Mosquera Losada
mrosa.mosquera.losada@usc.es

Enabling Environment Collaborations

Europe-ASIA: FOREST4EU (waiting for approval) with China

Europe: EFI, SCAR-AKIS, SCAR-Agroecology

Europe-South-AMERICA: FONTAGRO (waiting for approval)

International:

- * **FAO (Global agroforestry capacity needs assessment)**
- * **Circular Bioeconomy Alliance**
- * **UNDERTREES**
- * **UNFCCC NWP (Nairobi Work programme)**

CBA LIVING LABS: The Circular Economy Alliance



Publications

Reviews

Berta Gonçalves, Maria Cristina Morais, Sandra Pereira, María Rosa Mosquera-Losada, Mário Gabriel Santiago Santos (2022) **Tree-crop ecological and physiological interactions** within climate change contexts: a mini-review. *Frontiers in Ecology and Evolution*, section Models in Ecology and Evolution. <https://doi.org/10.3389/fevo.2021.661978>

Santos M, Cajariba RL, Bastos R, Gonzalez D, Petrescu Balas A-L, Ferreira D, Leote P, Barreto da Silva W, Cabral JA, Gonçalves B and Mosquera-Losada MR (2022) **Why Do Agroforestry Systems Enhance Biodiversity? Evidence From Habitat Amount Hypothesis Predictions**. *Front. Ecol. Evol.* 9:630151. doi: 10.3389/fevo.2021.630151

Damianidis, C., Santiago-Freixanes, J.J., den Herder, M. et al. **Agroforestry as a sustainable land use option to reduce wildfires risk in European Mediterranean areas**. *Agroforest Syst* 95, 919–929 (2022). <https://doi.org/10.1007/s10457-020-00482-w>

Rolo V, Rocas-Díaz V, Torralba M, Kay S, Fagerholme B, Aviron F, Burgess O, Crous-Duran J, Ferreiro-Dominguez N, Graves A, Hartel T, Mantzanas K, Mosquera-Losada MR, Palma J, Sidiropoulou A, Szerencsits E, Vlaudm V, Herzog F, Plieninger T, Moreno G 2022. **Mixtures of forest and agroforestry alleviate trade-offs between ecosystem services in European rural landscapes**. *Ecosystem Services* 50, 101318.

Publications

Land management

Alvarez-Lopez V, Lado-Linares M, Lamas A, Vázquez B and Mosquera-Losada R. (2022) **Circularity and biofertilizers use in Agroforestry systems: impact on soil health**. *Applied soil ecology* (accepted)

Ferreiro-Dominguez N, Rigueiro-Rodriguez A, Mosquera-Losada MR (2022) **Modelling Pinus radiata D. Don growth and pasture production under different land uses and climate scenarios**. *Frontiers in Ecology and Evolution* (Accepted)

Soil carbon stocks

N, Ferreiro-Dominguez, J.H.N. Palma, J.A. Paulo, A. Rigueiro-Rodriguez, M.R. Mosquera-Losada (2022) **Assessment of soil carbon storage in three land use types of a semi-arid ecosystem in South Portugal**, *CATENA*, 213, ISSN 0341-8162. <https://doi.org/10.1016/j.catena.2022.106196>.

Ferreiro-Dominguez, Nuria, Francisco Javier Rodriguez-Rigueiro, Antonio Rigueiro-Rodriguez, María Pilar González-Hernández, and María Rosa Mosquera-Losada (2022) **Climate Change and Silvopasture: The Potential of the Tree and Weather to Modify Soil Carbon Balance**. *Sustainability* 14, no. 7: 4270. <https://doi.org/10.3390/su14074270>

Chowdhury, Sangita, José Manjón-Cabeza, Mercedes Ibáñez, Christian Mestre, María José Broncano, María Rosa Mosquera-Losada, Josefina Plaibats, and M.-Teresa Sebastià (2022) **Responses in Soil Carbon and Nitrogen Fractionation after Prescribed Burning in the Montseny Biosphere Reserve (NE Iberian Peninsula)** *Sustainability* 14, no. 7: 4232. <https://doi.org/10.3390/su14074232>

Publications

Policies

- María Rosa Mosquera-Losada, Franciso Javier Rodríguez-Rigueiro, José Javier Santiago-Freijanes, Antonio Rigueiro-Rodríguez, Pablo Silva-Losada, Anastasia Pantera, Juan Luis Fernández-Lorenzo, María Pilar González-Hernández, Rosa Romero-Franco, José Antonio Aldrey-Vázquez, Nuria Ferreiro-Domínguez (2022) **European agroforestry policy promotion in arable Mediterranean areas**, *Land Use Policy*, Volume 120, 106274, ISSN 0264-8377, <https://doi.org/10.1016/j.landusepol.2022.106274>
- Santiago-Freijanes, JJ, Mosquera-Losada MR, Reis-Díaz M et al. **Global and European policies to foster agricultural sustainability: agroforestry**. *Agroforest Syst* 95, 775–790 (2021). <https://doi.org/10.1007/s10457-018-0215-9>
- Rodríguez-Rigueiro FJ, Santiago-Freijanes JJ, Mosquera-Losada MR, Castro M, Silva-Losada P, Pisanelli A, et al. (2021) **Silvopasture policy promotion** in European Mediterranean areas. *PLoS ONE* 16(1): e0245846. <https://doi.org/10.1371/journal.pone.0245846>
- Mosquera-Losada*, Santos M, Gonçalves B, Ferreiro-Domínguez N, Castro M, Rigueiro-Rodríguez A, González-Hernández MP, Fernández-Lorenzo JL, Romero-Franco R, Aldrey-Vázquez JA, Cabaleiro Sobrino C, García-Berrios JJ, Santiago-Freijanes JJ 2022 **Policy challenges for agroforestry implementation in Europe** "Frontiers in Forests and Global Change-Forest Management". In press.

Publications

Business environment and carbon farming:

Orozco, R.; Mosquera-Losada, M.R.; Rodríguez, J.; Adamseged, M.E.; Grundmann, P. **2021 Supportive Business Environments to Develop Grass Bioeconomy in Europe**. *2021 Sustainability* 2021, 13, 12629. <https://doi.org/10.3390/su132212629>

Participative research

Feo, E., Spanoghe, P., Berckmoes, E., Pascal E., Mosquera-Losada, R., Opdebeeck, A., Burssens, S. (2022) **The multi-actor approach in thematic networks for agriculture and forestry innovation**. *Agric Econ* 10, 3 (2022).

Bioeconomy

A.M. Freitas, V. D. Nair, W. G. Harris, M. R. Mosquera-Losada, N. Ferreiro-Domínguez (2022) **Pyrolysis-induced phosphorus transformations for biosolids from diverse sources**. *Journal of Environmental Quality* (Accepted)

Journal Special Issues: Potential for Collaboration

- **2022:** María Rosa Mosquera-Losada is editor of the Research Topic of "Can the Trees Save the Crops? Predicting the Services Provided by Traditional and Novel Agroforests in Changing Mediterranean Landscapes"? In *Frontiers in Ecology and Evolution*
- **2023:** Ladislau Martin-Neto is editor of Research Topic: "Soil Carbon Sequestration in Tropical and Subtropical Regions: A Paradigm Change" in *Frontiers in Soil Science*. On-going

Priority Activities

- Article "Soil organic carbon estimations"
- Foster collaborations with the previous networks through available funding: AF4EU
- Agroecology & Agroforestry flagship with the GRA
- **OUTCOMES:** Provide a list of locally adapted best practices linked to different regions of the world about innovative solutions linked to reaching carbon neutrality through the use of sustainable practices at agroecosystem, supply chain and policy scale (research, advisory, farmer support funding) associated with agroforestry and agroecology in the next three years, in selected countries all over the world.

LIFE SILFORE

COMPAS



GO-GRASS

LIFE VAIA



GOFORREST



UNDER TREES

Oper8



AF4EU

PYRICLABS



Contact: mrosa.mosquera.losada@usc.es



USC
UNIVERSIDADE
DE SANTIAGO
DE COMPOSTELA



Thank you!

Rosa Mosquera Losada

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Breakout Groups

- What do you need to scale up the adoption of CSA systems and practices like the ones we just heard about?
- How can GACSA help facilitate/support these efforts in your country/organization?



Report Out: Breakout Groups 1 - 6



Wrap Up: Challenge to GACSA Members

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Rose Mosquera, mrosa.mosquera.losada@usc.es