

CARBON SEQUESTRATION ON AGRICULTURAL LANDS

A CLIMATE CHANGE ADAPTATION AND MITIGATION STRATEGY



Why Sequester Carbon on Agricultural Land?

Agriculture makes its largest contribution to climate change with practices that erode and degrade soils, such as plowing, tilling, and clearing of land. These practices diminish the productivity of agricultural lands and release soil organic carbon into the atmosphere. With the agricultural sector contributing to approximately 18% of all human emissions and holding large swaths of degraded land, this industry holds the potential to make significant contributions to climate change mitigation through the application of farming practices that sequester carbon.

Selected Carbon Sequestration Techniques

Annual Cropping Systems

Techniques that allow you to continue growing desired annual crops while increasing carbon sequestration e.g. conservation agriculture, strip intercropping, alley cropping, living hedgerows/fences/windbreaks, and perennial crop rotation.

Perennial Cropping Systems

Techniques that incorporate more perennials to either replace or integrate with the growing of staple crops e.g. woody agriculture, short-rotation coppice, perennial grains, and herbaceous biomass crops.

Livestock Systems

Techniques for grazing and managing livestock while increasing sequestration e.g. managed grazing and improved pasture management, silvopasture, fodder banks, and restoration agriculture.

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Additional Benefits

Increasing soil organic carbon on your land also:

- Improves soil fertility (which buffers pH, helps prevent disease in crops, and increases the soil's capacity to hold water).
- Produces higher crop yields.
- Increases drought and flood tolerance.

Tips for Integrating Woody Perennials



Start small! Build your system over time to match your management style and site conditions.



Be prepared to prioritize irrigation while your perennials are establishing themselves (1-2 years).



Seed a cover crop while your perennials establish themselves to help suppress weeds, improve soil fertility, reduce erosion, and increase the soil's capacity to hold moisture.



Select a diversity of perennial species that are cold-tolerant and will thrive in a shorter growing season. Planting a diversity of species enhances biodiversity and reduces the risk of detrimental yield loss associated with storm events, drought, and flooding.



Plant on contour or use keyline design to slow the movement of water across your landscape, increase water absorption, and passively water perennials.



Group species by height and variety to ease harvesting and match species light preferences to site conditions to help ensure they thrive.



Convert sloped/degraded land that is not accessible or suitable for annual production to perennial production.

Additional Resources

Association for Temperate Agroforestry

www.aftaweb.org/about/what-is-agroforestry/alley-cropping.html

Evaluating Site Potential for Silvopasture

<https://cpb-us-e1.wpmucdn.com/blogs.cornell.edu/dist/d/5957/files/2015/03/SP-Site-Evaluation-Form-2gxsk8f.pdf>

USDA Alley Cropping Resources

www.fs.usda.gov/nac/practices/alley-cropping.php

Northeast Climate Hub Silvopasture Resources

www.climatehubs.usda.gov/hubs/northeast/project/agroforestry-angus-glen

USDA Perennial Windbreak Resources

www.fs.usda.gov/nac/practices/windbreaks.php

