Agricultural Conservation Practices for Climate Risk Reduction

USDA CARIBBEAN CLIMATE HUB for Tropical Forestry and Agriculture

The effects of climate change have been observed on agricultural lands in the Caribbean. Climate change effects include shifts in temperature and precipitation, which can manifest as water scarcity or excess, above normal temperatures, sea level rise, as well as frequent tropical storms. However, the implementation of conservation practices on agricultural lands helps to significantly reduce the effects of climate change. In order to describe the existing connection between the best conservation practices and the mitigation of climate change effects, the USDA Caribbean Climate Hub designed the following infographic.

The practices listed here are promoted by the Natural Resource Conservation Service (NRCS) to improve the conditions of soil, water, air and vegetation on agricultural lands. NRCS provides financial and technical assistance to farmers and landowners for the implementation of practices that conserve natural resources.

Soil health

Sheet and rill erosion

- 315 Herbaceous weed control ($)
- 327 Conservation cover
- 328 Conservation crop rotation
- 329 Residue and tillage management, no till
- 331 Contour orchard and other perennial crops
- 332 Contour buffer strips
- 340 Cover crop
- 342 Critical area planting
- 345 Residue and tillage management
- 381 Silvature establishment ($)
- 386 Field border
- 391 Riparian forest buffer ($)
- 472 Access control ($)
- 484 Mulching ($)
- 528 Prescribed grazing ($)
- 557 Row arrangement ($)
- 601 Vegetative barrier
- 612 Tree/shrub establishment ($)
- 635 Vegetated treatment area
- 645 Upland wildfire habitat management

Classic gully erosion

- 342 Critical area planting
- 391 Riparian forest buffer ($)
- 412 Grassed waterway ($)
- 472 Access control ($)
- 527 Karst sinkhole treatment

Soil erosion: streambank, shoreline and water conveyance channels

- 315 Herbaceous weed control ($)
- 342 Critical area planting
- 391 Riparian forest buffer ($)
- 472 Access control ($)

Wind erosion

- 315 Herbaceous weed control ($)
- 327 Conservation cover
- 328 Conservation crop rotation
- 329 Residue and tillage management, no-till
- 340 Cover crop
- 342 Critical area planting
- 345 Residue and tillage management, reduced till
- 380 Windbreak/shelterbelt establishment
- 381 Silvopasture establishment ($)
- 386 Field border
- 528 Prescribed grazing ($)
- 557 Row arrangement ($)
- 595 Integrated pest management ($)
- 603 Herbaceous wind barriers
- 609 Surface roughening
- 612 Tree/shrub establishment ($)
- 635 Vegetated treatment area
- 645 Upland wildlife habitat management
- 650 Windbreak/shelterbelt renovation
- 589C Cross wind trap strips

Organic matter depletion

- 327 Conservation cover
- 328 Conservation crop rotation
- 342 Critical area planting
- 379 Multi-story cropping ($)
- 380 Windbreak/shelterbelt establishment
- 381 Silvopasture establishment ($)
- 386 Field border
- 391 Riparian forest buffer ($)
- 393 Filter strip
- 412 Grassed waterway ($)
- 528 Prescribed grazing ($)
- 612 Tree/shrub establishment ($)
- 635 Vegetated treatment area
- 650 Windbreak/shelterbelt renovation

Runoff, flooding or ponding

- 310 Bedding
- 412 Grassed waterway ($)
- 423 Hillside ditch ($)
- 570 Stormwater runoff control
- 582 Open channel ($)

Water quality & availability

Inefficient use of irrigation water

- 320 Irrigation canal or lateral ($)
- 380 Windbreak/shelterbelt establishment
- 428 Irrigation ditch lining
- 442 Sprinkler system ($)
- 557 Row arrangement
- 650 Windbreak/shelterbelt renovation

Inefficient moisture management

- 380 Windbreak/shelterbelt establishment
- 472 Access control
- 557 Row arrangement ($)
- 558 Roof runoff structure ($)
- 603 Herbaceous wind barriers
- 650 Windbreak/shelterbelt renovation
- 666 Forest stand improvement ($)

Pesticides, nutrients, pathogens and chemicals in surface water

- 309 Agrochemical handling facility
- 313 Waste storage facility ($)
- 327 Conservation cover
- 329 Residue and tillage management, no-till
- 345 Residue and tillage management, reduced till
- 350 Sediment basin
- 379 Multi-story cropping ($)
- 380 Windbreak/shelterbelt establishment
- 381 Silvopasture establishment ($)
- 391 Riparian forest buffer ($)
- 393 Filter strip
- 590 Nutrient management
- 595 Integrated pest management ($)
- 614 Watering facility ($)
- 635 Vegetated treatment area
- 650 Windbreak/shelterbelt renovation
- 657 Wetland restoration
- 737 Reduce energy water conveyance system ($)
- 753 Infiltration ditches ($)

Sediment in surface water

- 327 Conservation cover
- 329 Residue and tillage management, no-till
- 342 Critical area planting
- 345 Residue and tillage management, reduced till
- 350 Sediment basin
- 381 Silvopasture establishment ($)
- 391 Riparian forest buffer ($)
- 393 Filter strip
- 472 Access control ($)
- 548 Grazing land mechanical treatment ($)
- 612 Tree/shrub establishment ($)
- 638 Water and sediment control basin ($)
- 644 Wetland wildlife habitat management

Pesticides, nutrients, pathogens and chemicals in subterranean water

- 309 Agrochemical handling facility
- 327 Conservation cover
- 391 Riparian forest buffer ($)
- 590 Nutrient management
- 595 Integrated pest management ($)
- 737 Reduce energy water conveyance system ($)

Salts in surface water

- 327 Conservation cover

Salts in groundwater

- 521A Pond sealing or lining, flexible membrane (○)
- 521D Pond sealing or lining, compacted clay treatment (○)

Key

Climate projections for Puerto Rico and the U.S. Virgin Islands

- Excess precipitation
- Precipitation deficiency
- Higher than average temperatures
- Sea level rise
- Tropical storms

Colors and symbols

The color scale indicates the relative degree that each practice contributes to the minimization of the environmental problem. The number sign ($) indicates the practices that are eligible for financial assistance through NRCS.

- Excellent
- Good
- ($) Elegible for financial assistance

Plant health

Undesirable plant productivity and health

- 327 Conservation cover
- 328 Conservation crop rotation
- 342 Critical area planting
- 379 $ Multi-story cropping
- 380 Windbreak/shelterbelt establishment
- 381 $ Silvopasture establishment
- 384 Woody residue treatment
- 386 Field border
- 391 Riparian forest buffer
- 393 $ Filter strip
- 394 $ Firebreak
- 412 $ Grassed waterway
- 472 $ Sprinkler system
- 490 $ Tree/Shrub site preparation
- 528 $ Prescribed grazing
- 548 $ Grazing land mechanical treatment
- 580 $ Streambank and shoreline protection
- 612 $ Tree/shrub establishment
- 644 Wetland wildlife habitat management
- 645 Upland wildlife habitat management
- 650 Windbreak/shelterbelt renovation
- 657 Wetland restoration
- 660 $ Tree/shrub pruning
- 666 $ Forest stand improvement
- 589C Cross wind trap strips

Inadequate structure and composition

- 314 $ Brush management
- 315 $ Herbaceous weed control
- 327 Conservation cover
- 328 Conservation crop rotation
- 379 $ Multi-story cropping
- 386 Field border
- 390 Riparian herbaceous cover
- 391 $ Riparian forest buffer
- 393 Filter strip
- 412 $ Grassed waterway
- 422 Hedgegrow planting
- 472 $ Access control
- 490 $ Tree/shrub site preparation
- 528 $ Prescribed grazing
- 580 $ Streambank and shoreline protection
- 603 Herbaceous wind barriers
- 612 $ Tree/shrub establishment
- 635 Vegetated treatment area
- 644 Wetland wildlife habitat management
- 645 Upland wildlife habitat management
- 646 Shallow Water development and management
- 657 Wetland restoration
- 660 $ Tree/shrub pruning
- 666 $ Forest stand improvement
- 589C Cross wind trap strips

Excessive plant pest pressure

- 314 $ Brush management
- 315 $ Herbaceous weed control
- 327 Conservation cover
- 331 Contour orchard and other perennial crops
- 332 Contour buffer strips
- 340 Cover crop
- 342 Critical area planting
- 379 Multi-story cropping
- 384 Woody residue treatment
- 386 Field border
- 391 $ Riparian forest buffer
- 393 Filter strip
- 412 $ Grassed waterway
- 422 Hedgegrow planting
- 472 $ Sprinkler system
- 490 $ Tree/shrub site preparation
- 580 $ Streambank and shoreline protection
- 603 Herbaceous wind barriers
- 612 $ Tree/shrub establishment
- 635 Vegetated treatment area
- 644 Wetland wildlife habitat management
- 645 Upland wildlife habitat management
- 657 Wetland restoration
- 666 $ Forest stand improvement

Wildfire hazard and excessive biomass accumulation

- 314 Brush management
- 383 $ Fuel break
- 384 Woody residue treatment
- 394 Firebreak
- 472 $ Sprinkler system
- 490 $ Tree/shrub site preparation
- 560 Access road
- 660 $ Tree/shrub prunning
- 666 $ Forest stand improvement

Livestock

Inefficient water quality and availability for livestock production

- 378 $ Pond
- 402 Dam
- 436 $ Irrigation reservoir
- 516 $ Livestock pipeline
- 533 $ Pumping plant
- 574 $ Spring development
- 614 $ Watering facility
- 636 $ Water harvesting catchment
- 642 $ Water well
- 521A $ Pond sealing or lining, flexible membrane
- 521D $ Pond sealing or lining, compacted clay treatment

Fish & wildlife

Inefficient water quality and availability for fish and wildlife

- 378 $ Pond
- 574 $ Spring development
- 614 $ Watering facility
- 636 Water harvesting catchment

Energy

Inefficient energy use for equipment and facilities

- 329 Residue and tillage management, no-till
- 374 $ Farmstead energy improvement
- 380 Windbreak/shelterbelt establishment
- 533 $ Pumping plant
- 650 Windbreak/shelterbelt renovation
- 666 $ Forest stand improvement
- 670 $ Lightning system improvement
- 737 $ Reduce energy water conveyance system

Key

Climate projections for Puerto Rico and the U.S. Virgin Islands

Excess precipitation
Increased incidence of extreme events during rainy seasons.

Precipitation deficiency
More dry days throughout the year and a greater potential for prolonged droughts.

Higher than average temperature
More days with temperatures above 95°F (35°C) and more nights above 85 °F (29 °C).

Sea level rise
A tendency towards a sea level rise of 2.02 millimeters per year.

Tropical storms
Intensification of hurricane and tropical storm incidence.

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- Good
- $ Elegible for financial assistance

Infographic created in collaboration with NRCS-Caribbean Area
All research at the International Institute of Tropical Forestry is done in collaboration with the University of Puerto Rico.

For more information, visit:
www.caribbeanclimatehub.org
www.nrcs.usda.gov/wps/portal/nrcs/site/pr/home/
info: caribbeanclimatehub@gmail.com

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