Climate Smart Agriculture: What's all the Buzz

Climate-smart Agriculture

- Integrated approach to managing landscapes
  - Cropland, livestock, forests, fisheries
- Addresses interlinked challenge of food security and climate change
- First defined in a 2010 by the Food and Agriculture Organization of the United Nations

Source: https://www.fao.org/3/i1881e/i1881e00.htm

Climate-smart Agriculture

- 3 main goals
  - Increase productivity
  - Enhance resilience
  - Reduce emissions
- Does not define any new farming practices
- Does include many of the things already being done
  - Nutrient management, conservation tillage, cover cropping, etc.

Why now?

- Growing global population
  - Changing diets
  - Increased demand for food
- Food production struggling to keep up
  - Crop yield leveling off globally
  - Stressing natural resources (soil, water, biodiversity)
- In 2020, 690 million people (8.9%) hungry

Agriculture and a Changing Climate

- Agriculture vulnerable to:
  - Increasing temperatures
  - Weather variability
  - Shifting agroecosystem boundaries
  - Invasive plants and insects
  - Increased frequency of extreme events
- Substantial investment in adaptation is needed to maintain and increase yields
Climate Change and Agriculture

- Agricultural generates 19 to 29% of total greenhouse gas emissions
- Food loss or wasted accounts for 1/3 of global production
- Opportunities
  - Lower emissions per unit produced
  - Sequester carbon

Overview of U.S. Greenhouse Gas Emissions in 2019

Resilient Soils Through Conservation Practices

GHG emissions Decreasing

Long-term Cropping System and Cover Crop Study - Cover Crops Between Wheat & Sorghum/Corn

On going since 2007
On-going work in Kansas

- Kansas Corn Growers Association / Soil Health Partnership: 3 producer projects (Rice and others).
- USDA-AFRI Sustainable Agricultural Systems Projects
  - Increasing Water Productivity, Nutrient Efficiency and Soil Health in Rainfed Food Systems of Semi-Arid Southern Great Plains (Rice and others)
  - Enhancing the Sustainability of US Cropping Systems through Cover Crops and an Innovative Information and Technology Network (Tomlinson and Presley)

Cover Crop Research in Western Kansas

Augustine Obour and John Holman
Western Kansas Agricultural Research Centers

Objectives:

- Determine cover crop management options for dryland systems.
- Determine impacts of removing cover crops for forage on soil health.
- Evaluate flex-fallow as a strategy for sustainable integration of cover crops in semiarid environments.

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Partnership for Climate-Smart Commodities

- USDA announced details in February 2022
  - Goal to finance partnerships to support production and marketing of climate smart commodities
  - Pilot projects to have a time frame of 1 to 5 years
  - Funding through USDA’s Commodity Credit Corporation
  - Two rounds of proposals
    - Round one large proposals $5 to $100 million
    - Round two small proposals $250,000 to 5 million

- September 2022
  - USDA announced selection of 70 projects (investment of $2.8 billion)
- December 2022
  - USDA announced selection of an additional 71 projects (investment of $325 million)
- 24 projects identifying Kansas

Partnership for Climate-Smart Commodities - Goals

- Provide technical and financial assistance to producers to implement climate-smart production practices on a voluntary basis on working lands
- Pilot innovative and cost-effective methods for quantification, monitoring, reporting and verification of greenhouse gas benefits
- Develop markets and promote the resulting climate-smart commodities
National Sorghum Producers Partnerships for Climate-Smart Commodities Project

• Implement climate-smart production practices across US sorghum acres

• Goal of reducing carbon emissions and developing markets for sorghum as a climate-smart commodity

K-State leading Climate-smart sorghum nitrogen fertility
  – Partners Oklahoma State, Texas A&M and A&M Prairie view

Modernize recommendations to reflect current:
  – tillage practices
  – enhanced efficiency fertilizer products
  – fertilizer application technology

Optimizing nitrogen use has the potential to:
  – Reduce the nitrogen input requirements to produce a bushel of grain
  – Reduce fertilizer input costs
  – Reducing the risk potential for nitrogen loss through leaching, runoff, and denitrification.

Thank you,

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