

Agency Climate Implementation Plan

Maryland Department of Agriculture

November 1, 2024





Agency Climate Implementation Plan

Maryland Department of Agriculture Climate Implementation Plan required by Executive Order, “Leadership by State Government: Implementing Maryland's Climate Pollution Reduction Plan”

In accordance with Governor Moore’s [Executive Order 01.01.2024.19](#), “Leadership by State Government: Implementing Maryland's Climate Pollution Reduction Plan,” the Department of Agriculture affirms its commitment to:

- Work to address climate change and ensure a just transition to a clean economy;
- Advance environmental justice by working to address the disproportionate impacts of climate change for underserved and overburdened communities, including the application of Justice40 goals, initiatives, and funding;
- Equitably implement all existing laws, regulations, and policies related to climate change, incorporating robust community and stakeholder engagement;
- Continue to maximize federal funding opportunities on climate;
- Provide technical and financial assistance to Maryland producers to participate in voluntary programs that advance adoption of climate smart agriculture; and
- Proactively coordinate with state agency partners and stakeholders to leverage efforts toward Maryland’s climate goals.

The Department of Agriculture (MDA) hereby submits its own Climate Implementation Plan (CIP) to demonstrate its commitment to a whole-of-government approach to addressing climate change and fully implementing Maryland’s Climate Pollution Reduction Plan.

Part 1: Agency Actions Under the Climate Pollution Reduction Plan

Maryland's Climate Pollution Reduction Plan calls on Maryland Department of Agriculture to:

1. Maximize MDA's Resource Conservation programs, which serve to increase the rate of best management practice adoption across Maryland's working lands. Adoption of key practices - conservation tillage, nutrient management, and diverse cover crops - on 80% of cropland is estimated to remove 0.9 MMTCO₂e annually. In addition,
 - a. Expand the adoption and implementation of agroforestry programs, and
 - b. Maximize Maryland's Healthy Soils Programs, as a result of the 2017 Healthy Soils Act. Development of programs include the Healthy Soils Competitive Fund, launched in 2023, and the *Cover Crop Plus* program of 2022. Programs such as these encourage continued innovation of practices and technology to achieve water quality, climate resilience, and carbon sequestration as co-benefits.
2. Apply for federal funding under the leadership and coordination of the Governor's Federal Office, all agencies will apply for federal funding to implement actions that support the achievement of this plan. State agencies will work closely with local governments, nonprofits, and community-based organizations to ensure Maryland is competitive for federal climate action implementation funds and to build capacity for local-level implementation. State agencies will offer support to Maryland's businesses and private sector to ensure they are competitive for historic federal investments.
3. Prioritize manure management and nutrient application initiatives to reduce greenhouse gas emissions with a focus on enteric fermentation from cattle. Modeled policy scenarios reduce emissions by 5.7 MMTCO₂e between 2023 and 2050 (Figure 3).
4. Pursue work and interagency collaboration to advance adoption and understanding of innovative technologies for the recovery of organic nutrient sources.

Please note: Other agency actions may be derived from the Climate Pollution Reduction Plan and explained in agency Climate Implementation Plans (e.g., policies related to sustainable/smart growth planning, commitments towards carbon sequestration on the state's natural and working lands and actions that align agency mission with sector specific decarbonization strategies).

Part 2: Recommending Actions to Address Climate Change

State law (MD Code, Environment, § 2-1305) requires that each State agency shall review its planning, regulatory, and fiscal programs to identify and recommend actions to more fully integrate the consideration of Maryland's greenhouse gas reduction goal and the impacts of climate change. The review shall include the consideration of (i) sea level rise; (ii) storm surges and flooding; (iii) increased precipitation and temperature; and (iv) extreme weather events. Furthermore, each State agency shall identify and recommend specific policy, planning, regulatory, and fiscal changes to existing programs that do not currently support the State's greenhouse gas reduction efforts or address climate change.

In compliance with the law, MDA is taking or recommending the following actions to more fully integrate the consideration of Maryland's greenhouse gas reduction goal and the impacts of climate change.

Enhancing Sequestration Activities

1. Permanently preserve key working lands through the Maryland Agricultural Land Preservation Foundation (MALPF) to support the state's goals of 40x40 (i.e. 40% preservation by 2040).
2. Achieve 100,000 acres enrolled in the Conservation Reserve Enhancement Program (CREP) and associated programs.
3. Advancing demonstration sites and education on agroforestry practices.
4. Develop program(s) or support for salt water inundation and sustainable retirement of marginal working lands as the current pace of inundation is leaving many producers and landowners with limited options. In counties such as Dorchester and Somerset, climate vulnerability is especially pronounced for saltwater inundation and sea level rise (SWISLR).
5. Expand climate smart agriculture practices through the Department's Conservation Grants and Healthy Soils Program.
 - a. Cover Crops and *Cover Crop Plus*
 - b. Agroforestry
 - c. Healthy Soils Competitive Fund (HSCF)
 - i. Current and future plans for the HSCF will advance a series of climate-smart practices that are consistent with the National Resource Conservation Service (NRCS) standards. MDA will evaluate outcomes using approved NRCS tools with additional consideration for

underserved producers or climate vulnerable designated areas of the state.

- d. Small and Urban Farm Program
- 6. Utilize tools and data - Maryland Soil Health Card, soils analysis, and USDA greenhouse gas calculator, COMET - to quantify benefits of conservation practices.
- 7. Develop recommendations for dual-use energy generation (agrivoltaics)
 - a. MDA is committed to protecting our state's historic and natural working agricultural lands. We are committed to advancing the conversations for the benefit of Maryland farmers. MDA prioritizes educating land owners on options for adopting agrivoltaic systems on agricultural lands, including the use of IRS Elective Pay for project reimbursement, in order to reach the state's renewable energy goals while promoting continuity of the greatest degree of agricultural production.



*Figure 1: No-till planting into a stand of multi-species cover crops on a Maryland farm.
Photo by Edwin Remsberg.*

Emission Reduction Activities:

- 1. Leverage Maryland's Animal Waste Technology [Fund](#) to best achieve emission reduction goals and advocate for technology retention within the state's Tier I renewable energy portfolio.
- 2. Align programs and interagency collaborations to build resilient food systems and

infrastructure within Maryland.

3. Initiate partnerships with research and/or higher education institutes to better quantify methane (CH₄) outcomes of conservation investments for:
 - a. Enhanced manure and fertilizer management, and
 - b. Legacy phosphorus and infrastructure restoration/upgrade for agricultural ditch management
 - i. This effort would focus on infrastructure along the Eastern Shore managed by Public Drainage Associations (PDAs). Currently, there are ~821 miles of agricultural drainage ditches on the Eastern Shore, benefiting over 200,000 acres of low-lying agricultural lands. The historic implementation of artificial drainage has modified the hydrology of the region and transport of nutrients, with lesser known implications for methane emissions from managing these systems.
4. Increase opportunities for Green Procurement training within MDA for continued improvement of agency vehicles and buildings.
 - a. Vehicle Fleets transition, to the greatest degree possible, a hybrid and/or electric vehicle fleet.
 - b. The department will analyze where the expansion of our current charging infrastructure may be expanded to support any continued feasible fleet transition.
 - c. Energy efficient updates to headquarters, including clean energy generation technologies, such as solar panels, solar hot water, ground-source heat pumps, efficient broilers, etc.

Additional information on enhancing sequestration, agricultural emissions, land use, and environmental justice will be available in the Agency's Annual Climate Report. Reports are hosted by MDE, and our report may [be found here](#).

Please note: The following agencies are already required to report annually on the status of programs that support the State's greenhouse gas reduction efforts or address climate change and may provide a link to their most recent annual report instead of providing a written response to part 2 above: (i) The Department of the Environment; (ii) The Department of Agriculture; (iii) The Department of General Services; (iv) The Department of Housing and Community Development; (v) The Department of Natural Resources; (vi) The Department of Planning; (vii) The Department of Transportation; and (viii) The Maryland Energy Administration).

Part 3: Considering Greenhouse Gas Emissions Reductions and Impacts on Disproportionately Affected Communities

State law (MD Code, Environment, § 2-1305) requires that each State agency, when conducting long-term planning, developing policy, and drafting regulations, shall take into consideration: (1) the likely climate impact of the agency's decisions relative to Maryland's greenhouse gas emissions reduction goals; and (2) the likely impact of the agency's decisions on disproportionately affected communities identified according to the methodology adopted under § 1-702 of the Environment article. Furthermore, Governor Moore's Executive Order 01.01.2024.19 requires each agency to report on how the agency will advance environmental justice by working to address the disproportionate impacts of climate change for underserved and overburdened communities.

In compliance with the law and Executive Order 01.01.2024.19, the Department of Agriculture is taking the following steps to meet these requirements.

The Maryland Department of Agriculture is dedicated to ensuring that programming and policy development is equitable and inclusive. Our producers and their operations are as varied as the landscape we live in. The locations and communities they exist within are an important factor when considering goals and co-benefits of programmatic and regulatory implementation. At the Maryland Department of Agriculture, we are committed to:

1. Hiring a full-time Climate and Equity Initiatives Coordinator to develop policy and guidance within the agency, and align state programs towards EJ goals.
2. Establishing Advisory Committees that reflect the demographics and communities that programs are intended to serve.
 - a. Urban Agriculture Advisory Committee
 - b. Soil Health Advisory Committee
 - c. Anaerobic Digestion Workgroup
 - d. Animal Waste Technology Fund Advisory Committee
 - e. Nutrient Management Advisory Committee
3. Develop farmer recognition programs to recognize the value of environmentally engaged farming.
4. Utilizing tools, as applicable, to achieve MDA goals:
 - a. MDE Climate Vulnerability Tool

- i. This will be particularly useful in future SWISLR planning, for example. As we are able to pinpoint counties that are facing higher incidents of flooding and the effects of salinization.
 - b. EPA EJScreen
 - i. Used mainly for comparison in the use of nationally consistent data sets along with environmental and sociodemographic indicators.
 - c. Grocery Gap Atlas by the University of Chicago Open Spatial Lab and the Rural Advancement Foundation International (RAFI)
 - i. While a much newer tool, the atlas allows for the visualization of current and historical data that allows us to understand impacts of the grocery markets and food access. This is particularly important as we build out programming that allows the department to address and advocate for more sustainable and circular food systems in priority zones.
 - ii. Many of these communities are underserved and are often climate vulnerable.
5. Engage with Maryland Department of Environment on the development of the next General Discharge Permit for Animal Feeding Operations, expected by summer 2025. Applicant technical assistance will be supported through MDA, and consideration of EJ measures in new permit language will be coordinated.

Please note: MDE has developed a tool to identify climate vulnerable communities, in accordance with MD Code, Environment, § 1-702. This approach identifies communities disproportionately affected by climate impacts using a vulnerability index that scores census blocks based on a community's existing sensitivity, adaptive capacity, and its exposure to urban heat island, storm surge, flooding, and drought conditions. Climate impacts are aggregated and combined with MDE's EJScreen percentile score to classify a community's climate vulnerability as baseline, low, moderate, or high. This methodology utilizes EJScreen to identify underserved and overburdened communities with respect to existing pollution burden exposure and associated environmental effects, population sensitivity, and various socioeconomic/demographic indicators. State agencies are already required to use a community's climate vulnerability score in reporting for Maryland's greenhouse gas spending analysis and are encouraged to use this tool to meet requirements in agency CIPs.

MDA Spending In Climate Vulnerable Communities (2024)

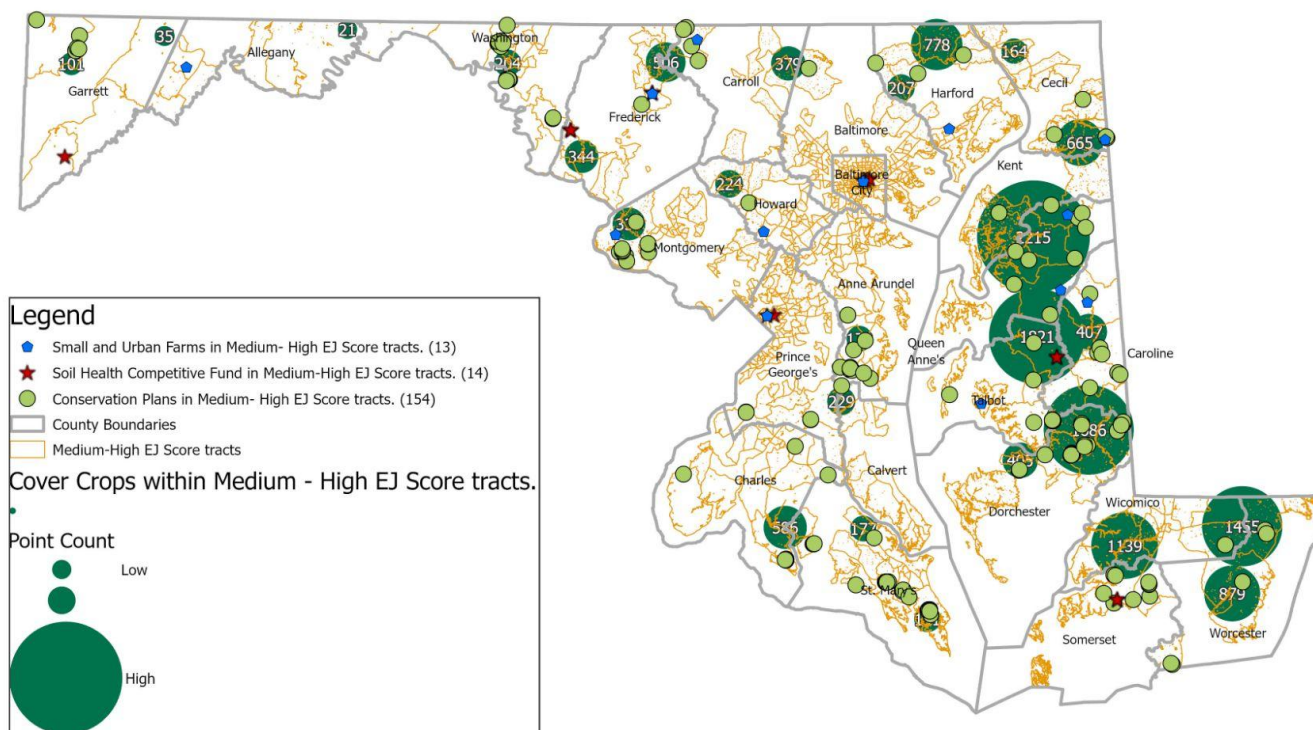


Figure 2: Non-federal expenses in MDA's Resource Conservation programming totaled \$60.5 million for fiscal year 2024. Of that, 99% of funding was reportable for Greenhouse Gas (GHG) reduction efforts. The distribution of those funds benefiting disproportionately affected and climate vulnerable communities accounted for 28%.

Part 4: Resources for Implementation

Implementing Maryland's Climate Pollution Reduction Plan

The activities described in Part 2 and Part 3 are all currently ongoing. MDA priorities for state fiscal year 2025-2026 are further described below:

Table 1: Current status of priority activities identified in part 2 and 3 of CIP.

Activity	Status	Resources
Increasing acres of agroforestry practices	In progress	The MDA Healthy Soils Competitive Fund and new Climate Pollution Reduction Grant will provide financial resources. Additional technical assistance to support producers is needed.
Continue to collect and analyze soil health data evaluation data to improve quantification of soil health outcomes across diverse production systems	In progress	Additional funds to continue the collection of biological soils data will be pursued. Partnerships and funding to analyze data are being identified.
Develop potential research scope for emission reduction activity #3, Part 2 (i.e. quantifying methane outcomes).	Need identified	Funding resources will need to be secured. Preliminary discussions with academic partners have occurred.
Pursue program development with key partners and landowners to address SWISLR lands	Need identified	Funding resources will need to be secured. Preliminary discussions with partners have occurred.
Develop farmer recognition programs to recognize the value of environmentally engaged farming.	In progress	In progress

Implementing this Climate Implementation Plan

Current Funding

MDA annually utilizes a variety of state funding sources (general, bonds, revenue funded, etc.) toward existing financial assistance programs that achieve sequestration and emission reduction activities (e.g. implementation of best management practices). It is the policy of MDA to leverage programs to the greatest attainment of co-benefits for water quality, soil health, and climate resilience outcomes. State funded programs include:

- [Maryland Agricultural Land Preservation Foundation](#)
- Maryland Agricultural Water Quality Cost-Share Programs ([MACS](#))
- [Cover Crop](#) and Cover Crop [Plus](#)
- [Small and Urban Farms Program](#)
- [Healthy Soils Program](#)
- [Ecosystem Incentives](#)
- [Animal Waste Technology Fund](#)

In addition to state funding sources, MDA regularly pursues federal and federal-partner grants to accelerate programs and advance research into areas of identified need. Recent examples include:

Farming for Healthy Soils, funded by National Fish and Wildlife Foundation

At the creation of the Maryland Healthy Soils Act, no funding was allocated to the Department of Agriculture to accomplish the legislative charge. The Department of Agriculture was able to secure ~\$1 million in funding, starting in 2020, to secure the staff and the Soil Health Advisory Committee to lay the foundation of today's successful program.

Incentivizing Habitat Restoration on Working Lands in Maryland, funded by National Fish and Wildlife Foundation's Chesapeake Watershed Investments in Landscape Defense (Chesapeake WILD). Announced in September 2024, the Department of Agriculture has received a \$500,000 grant to promote agricultural conservation practices on working lands to benefit rare and declining species. The project will restore 500 acres of riparian habitat, 500 acres of wetlands and implement more than 1,000 acres of wildlife habitat improvement practices closely aligned to the state's Conservation Reserve Enhancement Program goals.

Atlantic Conservation Coalition, funded by US EPA Climate Pollution Reduction Grant
Maryland is a multi-state partner to leverage the carbon sequestration power of each state's

natural and working lands. As a sub-recipient of funding, the Department of Agriculture anticipates receiving \$5 million, beginning in calendar year 2025, to implement 1,000 acres of additional agroforestry practices. Maryland has existing programs which support tree planting across the state. However, historically funding and technical support has focused on the re-treeing of stream buffers and marginal agricultural land, and programs supporting the unique technical and financial needs of the intentional planting of trees and other woody perennial for agroforestry systems have been lacking. As a result, adoption of agroforestry practices in the state remains low. Data from the 2017 USDA Census of Agriculture indicated that only 3.8% of Maryland farms reported implementing an agroforestry practice. Funding awarded from the grant will be applied towards the department's expansion of healthy soils and the implementation of agroforestry through the Healthy Soils Program.

Funding Needs:

Conservation program participation, with the exception of regulated nutrient management, is a voluntary effort among Maryland producers. To-date, MDA has had sufficient funding to meet the financial requests of its producers and regularly evaluates its budget and program demands to ensure equitable and effective administration of the funding. However, to advance adoption of activities outlined in Part 2 and 3 of this Plan, MDA offers the following comments:

- Maryland is a national leader in the adoption of key climate smart agricultural practices - conservation tillage, nutrient management, and cover crops^A. In order to increase adoption (where feasible) or to incentivize adoption of additional desired practices, the state will need to consider payment(s) and/or tax incentives for the greatest ecosystem services provided on working lands. Private carbon markets, to-date, have limited eligibility for Maryland farms with a long history of conservation.
- A current Nutrient Management Plan is a required compliance step for the majority of Maryland farms, and necessary for participation in any state funding program. Plans must be prepared by a certified plan writer through the private sector, University of Maryland Extension, or a self-certified farmer. Training and a larger network of certified plan writers is needed in some regions, along with funds to update the University's nutrient management plan writing software (NuMan Pro) used by many, to ensure compliance with state regulations.
- Technical assistance for producers, especially for small and urban farms, diversified rotations, and agroforestry will require additional expertise and staff among the state's 23 Soil Conservation Districts.
- On-farm anaerobic digestion provides a multi-benefit, circular opportunity to achieve farm and climate sustainability for Maryland producers (Figure 3). However, the

capital costs of the systems and associated education (farmers and neighboring communities) will require investment beyond the Animal Waste Technology Fund's current budget of \$500,000 - \$1 million annually. Utilization of the IRS Direct Pay incentives may be an option to consider.

- Funding for partnerships with institutions of higher education is needed to continue advancing the science, measurement and verification of desired outcomes.

(Please note: agencies may already be reporting relevant outcomes as KPIs through the State Performance Plan and related reporting requirements. State agencies are encouraged to make reference to those KPIs here. MDE will be summarizing progress on the Climate Pollution Reduction Plan via the triennial GHG Inventory and with KPIs similar to those highlighted in the 2022 GGRA Progress Report).

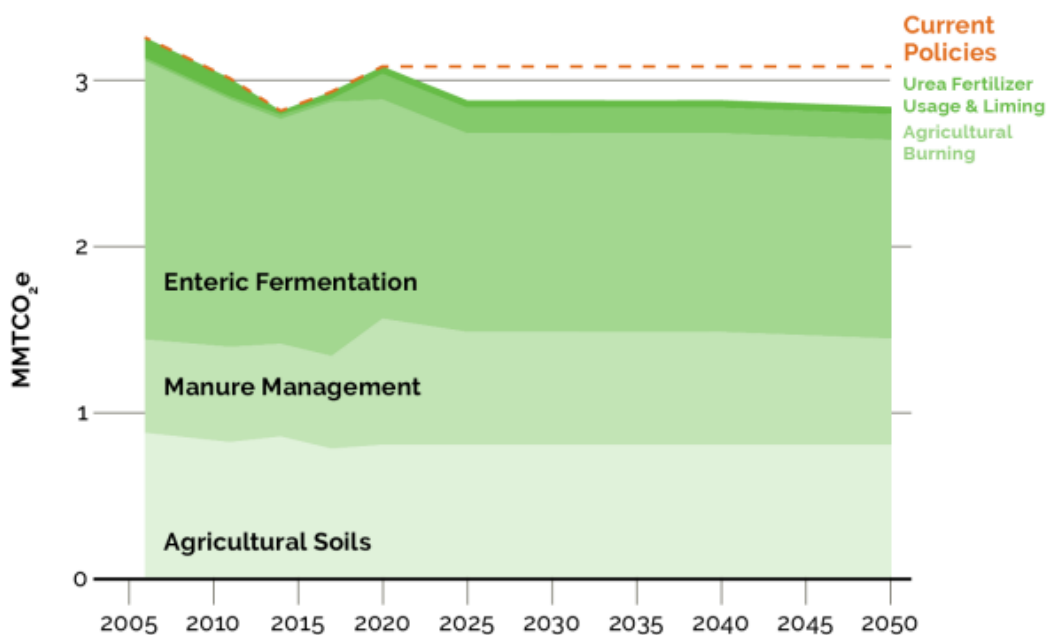


Figure 3: Modeled policies to reduce emissions from agriculture focus on cost-effective solutions for methane reductions from livestock, including anaerobic digestion systems and increased rotational grazing. Additional state investment into these systems will be needed to scale adoption.

Part 5: Outcomes from Implementation

The following Key Performance Indicators (KPIs) are being tracked and reported consistent with the Moore-Miller 2024 State [Plan](#) priority #9 “Making Maryland a Leader in Clean

Energy and the Greenest State in the Country”.

9.1 Decarbonize and electrify across all sectors - Increase carbon sequestration and state decarbonization strategy

1. Animal units that are treated by animal waste technologies or through conservation practices in order to decrease GHG emissions. *Metrics and goals are under development.*
2. Agriculture acres implementing healthy soils practices. *Goal is under development.*
 - a. Note, in collaboration with MDE, carbon sequestration benefits as a result of healthy soils practices will also be incorporated into the state’s GHG inventory.

9.2 Increase resilience and protect the health of the Chesapeake Bay - Reduction of run-off and pollution into Chesapeake Bay from agriculture strategy

1. Number of Maryland Agricultural Water Quality Cost-Share (MACS) Program best management practices (BMPs) that are adopted by farms. Goal of 650 practices annually.
2. Percentage of farmers in compliance with Nutrient Management (NM) Plans. Goal of 82% compliance annually by 2025

9.2 Increase resilience and protect the health of the Chesapeake Bay - Improve resiliency for vulnerable communities near the Bay strategy

1. Number of acres managed under current Conservation Plans. Goal of 1 million acres by 2025.

As this Climate Implementation Plan is implemented, MDA is committed to working alongside MDE and other sister agencies in order to address climate change with Maryland’s whole of government approach.

- MDA will aim to stay in consistent communication with MDE in order to align, monitor, and track progress from priority goal implementation.
- In compliance with the Climate Solutions Now Act of 2022, MDA will continue to make climate and equity key considerations in the long term planning of the department’s policy planning and operations.

- A. The USDA Census of Agriculture is completed every 5 years. The most recent Census completed in 2022, shows Maryland is at 92% [adoption](#) of conservation tillage across cropland acres (#2 in US) and #1 in adoption of cover crops as a [percentage](#) of cropland acres. Compliance with nutrient management regulations is reported annually based on on-farm evaluations. The most recent data (FY23) reported 80% compliance.