



Water Quality Sustainability for Dairy Cooperatives and Processors

The dairy industry is integral to the Chesapeake Bay region's economy, culture and environment. Improving water quality—one of the most pressing issues for the region—is important for the near- and long-term viability of the dairy industry, the communities that depend on the sector and the quality of the natural resources.

This guide aims to help dairy cooperatives and processors set goals, develop water quality programs, and engage farmers to make measurable progress on business and environmental outcomes.

On-farm dairy water quality program

1. Determine your starting point.

- Identify your sourcing footprint: The location of the majority of member or supplying dairy farms and millsheds (area around supplying feed mills) from where those dairies source grain not produced on the farm.
- Identify your starting point, or baseline, on sustainability.

2. Identify goals and desired outcomes.

- Select a process and determine your goal and the outcomes you want.
- Develop a plan for evaluating progress, fine-tuning and scaling the program.

3. Develop or select a data collection platform or process for tracking progress.

4. Develop on-farm continuous improvement program for participating farmers and their advisers.

- Connect to farmers' ag service professionals.
- Create a continuous improvement program to be delivered via farmers' ag service professionals for farm-level conservation improvements that in aggregate will deliver on your cooperative or processor sustainability goals for water quality. You can use or adapt our model farm level program or develop your own.

Key components of a continuous improvement program

- Connect to farmers' ag service professionals.
- Evaluation: Assess current on-farm management, i.e., nutrient management plans, soil conservation plans, manure management plans and status of implementation of priority practices.
- Planning and implementation: With the assessment in hand, the farmer should work with his/her adviser to identify priority nutrient, soil, and/or manure management areas for improvement. Data collection to evaluate and track progress and benefits is key.
- Evaluation and continued refinement: Evaluate what worked well and what did not work well in the past growing season. Identify refinements to plan and one or more new practices to evaluate or adopt.

- Identify and share with farmers and their ag service providers the available programs and resources in the local area.
 - Technical Assistance and farmer engagement resources.
 - Nutrient use efficiency (NUE) and soil health resources.
 - Business management resources.
 - University and Extension programs.
 - Survey and measurement resources.

5. Support farmer participation and communicate results.

- Identify ways to communicate progress and success to your farmers, buyers and the community.
- Identify or establish ways to motivate and reward participating farmers.

6. Tell your story.

- Identify your key audiences: Likely dairy and grain farmers in your supply chain, ag service professionals working in your sourcing regions, food companies and retailers who buy your milk and dairy products, watershed organizations, consumers and health professionals.
- Develop and implement a communications plan. Some tools for effective communications include releasing press announcements of key collaborators involved in your program; sharing highlights in company annual reports; speaking at stakeholder events; posting updates, overviews and farmer stories on your website; sharing updates via blogs or social media; and creating videos of farmer success stories.

On-farm water quality program for crop and forage production

Because every farm is unique, sustainability cannot be a one-size-fits-all prescription.

Priority NUE best management practices (BMP)

Foundational sustainability for feed/forage production

- Base nutrient management plan (NMP).
 - In that base NMP, use science-based process for determining rate. Options include but are not limited to:
 - Land grant university (LGU) recommendation.
 - On-farm trials to determine economic optimum rate.
 - Stalk nitrate or tissue testing to evaluate and set rate.
 - Nitrogen (N) decision support tool to determine rate.
 - Field history of yields from which an N recommendation is made based on yield goal system (use of LGU recommended rate preferred).
 - Testing protocol in place for manure, soil, crop tissue and forages.

- Avoid applying most/significant N in the fall.
- Split spring applications of N.
- Swath/section control (reduce effects of overlapping applications in a field).
- N stabilizer (see NutrientStar for guidance).

Continued refinement and improvement of NUE in feed/forage production

- Improved integration and crediting of manure in crop nutrients.
- Incorporation of manure.
- Following recommendations using N modeling tool (see NutrientStar for guidance).
- Tissue analysis to evaluate and refine rate.
- Develop and implement a plan based on zone management.
- Drone NDVI sensing and N recommendations.
- Optical sensor technology and variable rate application (see NutrientStar for guidance).
- Manure additives.

Priority soil health and edge of field BMPs for feed/forage production

- Cover crops.
- Conservation tillage or no till.
- Soil health analysis.
- Add additional crop to rotation (or more).
- Wetland (designed/placed to intercept water flow from field/farm).
- Riparian buffer (designed/placed to intercept nutrients/soil).
- Forested buffer (designed/placed to intercept nutrients/soil).
- Use of evaluation tool to identify unprofitable/high-risk areas in field (i.e., AgSolver).

On-farm water quality checklist for barnyard and manure management

- Evaluate manure/barnyard management, pasture management, commodity storage and management, storm water and mortality management. Identify any problem areas on the farm.
- Assess status of manure balance or excess. Develop plan to export or alternative use for excess beyond what the farm can use appropriately in feed/forage production.
- Evaluate manure management: storage needs, barnyard management, fencing, application practices, excess manure and need to export.
- Develop and implement plan for ongoing improvements.
- Annual evaluation of plan to identify improvements, continue to refine and identify opportunities for further improvement.

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