



Agricultural Best Management Practices for PENNSYLVANIA

Pennsylvania is working with neighboring states to clean up our shared waters that run to the Chesapeake Bay. This effort is the Phase 3 Watershed Implementation Plan (Phase 3 WIP). The state believes that the path to success starts locally. Farmers have an important role to play.

This document summarizes seven farm practices that reduce nitrogen and phosphorus pollution. Goals, cost estimates, and pollution reduction forecasts are included for each practice.



Agricultural Compliance

Action: Develop and use Agricultural Erosion and Sediment Control (Ag E&S) Plan or conservation plan, manure management or nutrient management plan, and barnyard runoff controls.

- Goal 1:** 90% manured cropland have & follow manure and nutrient management plans (1,724,000 acres).
- Goal 2:** 90% of croplands have & follow Ag E&S or conservation plans (2,250,000 acres).
- Goal 3:** Barnyard runoff controls on 90% of permitted CAFOs (3,900 acres).
- Goal 4:** Barnyard runoff controls on 67% of non-CAFO livestock farms (3,900 acres).
- Estimated annual cost: \$33,105,000**

Nitrogen runoff reduced by 7,381,000 lbs or 14% of PA's Goal

Phosphorus runoff reduced by 251,000 lbs or 12% of PA's Goal

Soil Health

Action: Use crop and soil management practices that improve long-term soil health and productivity.

- Goal 1:** Conservation tillage or no till on 67% of croplands (1,115,000 acres).
- Goal 2:** Non-harvested cover crops on 33-50% of croplands (833,000 acres).
- Goal 3:** Prescribed grazing on 50% pastures (180,000 acres).
- Estimated annual cost: \$32,980,000**

Nitrogen runoff reduced by 7,337,000 lbs or 14% of PA's Goal

Phosphorus runoff reduced by 298,000 lbs or 15% of PA's Goal

Expanded Nutrient Management

Action: Non-manured farms develop & use nutrient management plans and precision nutrient management practices.

- Goal 1:** 20% of non-manure croplands have and follow Nutrient Management Plans (64,640 acres).
- Goal 2:** 20% of non-manure croplands use "4Rs" for nitrogen and phosphorus (64,640 acres).
- Estimated annual cost: \$20,853,000**

Nitrogen runoff reduced by 755,000 lbs or 1% of PA's Goal

Phosphorus runoff reduced by 34,000 lbs or 2% of PA's Goal

Manure Storage Facilities

Action: Install and use manure storage systems that meet state and federal standards.

- Goal 1:** 90% of swine and poultry operations have proper manure storage facilities.
- Goal 2:** 75% of other livestock operations have proper manure storage facilities.
- Estimated annual cost: \$214,017,200**

Nitrogen runoff reduced by 7,167,000 lbs or 14% of PA's Goal

Phosphorus runoff reduced by 300,000 lbs or 15% of PA's Goal

Precision Feeding

Action: Use precision feed management to reduce nitrogen and phosphorus in manure.

- Goal 1:** 33% of cows fed with precision feed management (152,000 cows).
- Estimated annual cost: - \$1,687,000 (this practice saves farmers \$\$)**

Nitrogen runoff reduced by 604,000 lbs/yr or 1% of PA's Goal

Phosphorus runoff reduced by 61,000 lbs/yr or 3% of PA's Goal

Integrated Systems for Elimination of Excess Manure

Action: Create integrated (county/regional) programs for removal of or beneficial use of excess manure.

Goal 1: Develop coordinated regional systems for removing excess manure (through treatment or transportation) from the Bay watershed.
Estimated annual cost: \$4,653,000

Nitrogen runoff reduced by
1,200,000 lbs or 2% of PA's Goal

Phosphorus runoff reduced by
95,000 lbs or 5% of PA's Goal

Grassed Riparian Buffers

Action: Plant grassy vegetation along streams.

Goal 1: 15% of non-buffered streamside farm lands add 35 ft wide grassed buffer (50,000 acres).
Estimated annual cost: \$8,957,300

Nitrogen runoff reduced by
8,250,000 lbs or 16% of PA's Goal

Phosphorus runoff reduced by
1,010,000 lbs or 49% of PA's Goal

Cumulative Results of Recommended BMP Implementation

Action: All of the listed recommendations are implemented in PA's Bay watershed counties.

Total Estimated annual cost: \$353 Million

Nitrogen runoff reduced by
32.7 million lbs or 64% of PA's Goal

Phosphorus runoff reduced by
2.05 million lbs or 100% of PA's Goal

Additional Recommendations

Farmers will still face serious challenges in fully achieving these goals. To realistically engage farmers, Pennsylvania must also take the following actions:

1. **Discourage Legal Mandates.** Local governments should avoid reaching water quality goals through land use ordinances. These measures are likely to reduce local support and result in inconsistent criteria.
2. **Offer Financial and Tax Incentives.** Develop compensation programs and tax incentives for participating in practices that restrict land use.
3. **Increase Reporting Confidentiality.** Farms have privacy concerns about reporting their use of these practices. The state should update its laws to protect these reports from "right-to-know" requests.
4. **Offer Technical Assistance.** A significant increase in financial resources and technical assistance staff will be needed to help farmers put conservation measures in place. Permitting processes should also be streamlined.
5. **Promote Advanced Soil Health.** The state should invest more in advanced soil health management on farms. Pennsylvania farmers should get credit for pollution reduction from advanced soil health projects.
6. **Consider Regulatory Incentives.** Develop programs that offer farmers temporary relief from new regulations in return for putting in recommended practices.
7. **Reevaluate Existing Funding.** These practices are costly for many farms. The state should find ways to redirect more funds to support Phase 3 WIP conservation efforts.
8. **New Biosolid Standards.** The nutrient management planning standards for land application of biosolids should be consistent with standards for animal manure.
9. **MS4s.** Make it possible for urban areas to meet their MS4 requirements by supporting recommended practices on farms.
10. **Stream Restoration.** Increase coordination between stream restoration and riparian buffer projects where appropriate.
11. **Legacy Sediment.** Pursue restoration projects to address legacy sediment. Ensure the state gets credit for these improvements.



Challenges

To reach these goals, the state, partners, and farmers will have to overcome some challenges. The Phase 3 WIP Agriculture Workgroup offers the following recommendations for how to do that:

1. **Communication.** Regulators should consistently communicate compliance requirements across the numerous entities supporting this work in the agricultural community.
2. **Staff & Training.**
 - a. The Department of the Environmental Protection does not have enough staff for compliance assurance on small operations (see Resource Needs below). New staff will need to be trained.
 - b. Partner organizations will need additional technical assistance providers to support implementation goals (see Resource Needs below).
3. **Operational Realities.** Farmers' decision making and planning for conservation practices is often long term and deliberate. New practices often require changes in long-established operations and implementation costs often cannot be covered by the farmer.
4. **Timing.** It can take up to 3 years to implement conservation practices. Practices require planning, permitting, obtaining additional funding, contracting, and construction.
5. **Finances.** Conservation practices can be expensive and significant funding is needed to reach the Ag Workgroup's recommended level of BMP implementation (see Resource Needs below).
6. **Tracking.** There currently is no industry-wide data recording or reporting process for small farms to allow for tracking of progress in achieving the level of ag conservation measures recommended in the Phase 3 WIP.
7. **Scale.** To reach these goals, the partners will have to reach thousands of additional farms:
 - a. CAFO Program (~ 400 larger animal farms in the Chesapeake Bay watershed)
 - b. Nutrient Management Program (~ 815 high intensity animal farms in the Chesapeake Bay watershed)
 - c. Remaining farms (~33,610 additional farms in the Chesapeake Bay watershed)

Resource Needs

To reach these goals, the state, local partners, and farmers will need additional support. The Phase 3 WIP Agriculture Workgroup offers the following recommendations for how to do that:

1. **Agricultural Compliance (Permitting, Compliance Assurance, Inspection, Enforcement).** Agencies need continued funding for current staff, plus additional staff for the expanded ag compliance program:
 - a. DEP – Maintain current staff; plus 10.5 additional staff positions (\$1,161,492)
 - b. Conservation Districts – Continue funding for Nutrient Management (35 staff) and Chesapeake Bay Technicians (39 staff)
2. **Technical Assistance for BMP Design, Oversight and Implementation.** Partners need additional staff to provide technical assistance to the agricultural community:
 - a. Conservation District staff –all time spent on technical assistance (\$3,970,000);
 - i. 50 additional Chesapeake Bay Technicians
 - ii. 10 additional Chesapeake Bay Engineers
 - b. Private Industry/NGO/NRCS—all time spent on technical assistance no inspections or planning
 - i. 87 additional private industry/NGO/NRCS staff
3. **Financial Assistance for BMP Design and Implementation.** Significant funding is needed to support the implementation of agricultural BMPs.
 - a. It will cost approx. \$327 million/year to fund recommended agricultural BMPs through 2025
 - b. A simple application process for public support funds is needed to encourage BMP implementation.



Action Steps

The Phase 3 WIP Agriculture Workgroup recommends the following action steps to support nutrient reduction efforts:

1. **Communications and Outreach.** Rfffff
2. **Funding and Resources.** ttt.
3. **Expanding Capacity for Technical Assistance.** lssss.
4. **Reporting and Tracking.** Work with the Chesapeake Bay Program Partnership to establish a creditable practice or combination of practices for implementation of advanced soil health strategies or plans on farms in the Chesapeake Bay Watershed Model for future crediting of these initiatives. Once established as a practice, or set of practices that can be credited for progress in the model, commit additional funding or the technical and financial assistance necessary to implement these practices.
5. **Compliance.** Tjjjj



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