



Farming with Your Nutrient Management Plan

A COMPREHENSIVE GUIDE

to Maryland's Nutrient Management Regulations and Requirements

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A large, modern greenhouse with a high, arched metal frame and translucent panels. The interior is filled with rows of plants growing in trays. The plants are arranged in long, straight rows that recede into the distance. The lighting is bright and even, suggesting a controlled environment. The overall scene is one of organized, large-scale agriculture.

INTRODUCTION

Maryland law requires all farmers grossing \$2,500 a year or more or livestock producers with 8,000 pounds or more of live animal weight to follow nutrient management plans when fertilizing crops and managing animal manure. These science-based plans specify how much fertilizer, manure or other nutrient sources may be safely applied to crops to achieve yields and prevent excess nutrients from impacting waterways. Nutrient management plans are required for all agricultural land used to produce plants, food, feed, fiber, animals or other agricultural products.

To take advantage of the latest scientific research on nutrient movement and provide enhanced protections for Maryland's waterways, the Maryland Department of Agriculture periodically updates its nutrient management requirements. New regulations adopted in 2015 provide a multi-year process for farmers with high soil phosphorus levels to transition to the Phosphorus Management Tool in preparing their nutrient management plans. This updated environmental risk assessment tool identifies farm fields with high soil phosphorus levels and allows farmers to evaluate management options to reduce the risk of phosphorus runoff into nearby waterways. Additional modifications to the department's nutrient management regulations prohibit farmers statewide from applying manure, commercial fertilizer, biosolids, and food wastes from December 16 to March 1. Farmers also are required to incorporate manure and other organic nutrient sources into tilled fields. Farmers who are using no-till farming practices are exempt from this requirement.

This guide is designed to help farmers follow their nutrient management plans and comply with all nutrient application and reporting requirements. For additional guidance and clarification, farmers should contact their nutrient management consultant or regional nutrient management office listed on the back of this guide.

Implementing Your Nutrient Management Plan

Nutrient management plans detail the optimum use of nutrients to minimize losses to the environment while maintaining crop yields. Soil and manure tests are used to develop application rates that meet projected crop yields based on soil productivity or historic yields of a site. Plans are prepared by University of Maryland Extension advisors, private consultants who are certified by the Maryland Department of Agriculture, or farmers who are certified to develop plans solely for their own operations.

Implementing a nutrient management plan requires farmers to follow guidelines for the amount, timing, and placement of nutrients on each crop. Plans must be revised and updated before they expire. Most plans are written for one or three years. The expiration date can be found on the plan. Major changes to an operation may require a plan to be modified or updated sooner. In addition, farmers must have a soil test completed at least once every three years. Farmers who use manure must have it analyzed for nutrient content at least every other year.

The success of a nutrient management plan in protecting water quality often hinges on whether the farmer has read the plan and communicated its content to other family members, hired employees, or their fertilizer company. Farmers should contact their nutrient management consultant if they have questions about their plans. It is important for farmers to show by their actions that plans

are being followed and used—instead of collecting dust on a shelf. For some farm employees, training may be needed in equipment calibration and record keeping. Most important, it is the farmer's responsibility to assure that the plan is put into action.

ADDITIONAL REQUIREMENTS:

Nutrient Applicator Voucher Training

Farmers who apply nutrients to 10 or more acres of cropland are required to attend a two-hour nutrient applicator training course once every three years. Free voucher training and recertification courses are offered in fall and winter by the department and Extension at locations across the state. Farmers who are certified to write their own nutrient management plans are not required to attend voucher training, however, they are required to take six hours of continuing education credits every three years.

Annual Implementation Reporting

Farmers are required to submit Annual Implementation Reports to the Maryland Department of Agriculture by March 1 summarizing their nutrient management for the previous year. While nutrient management plans contain recommendations for nutrient applications, the reporting form is a summary of actual nutrients applied to crops during the previous calendar year. The department mails reporting forms to farmers in January and posts them on its website at mda.maryland.gov.



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Nutrient Application Requirements

Nutrient application requirements vary, depending on the crop, season, nutrient source, and weather conditions. Here in Maryland, farmers are required to follow University of Maryland nutrient recommendations and use best management practices that minimize nutrient losses to nearby waterways as outlined in Maryland's Nutrient Management Manual. **The following requirements apply:**

- Chemical fertilizer may be applied from March 1 through December 15 for an existing crop or a fall planted crop following University of Maryland recommendations.
 - Organic nutrients may be applied from March 1 through December 15 for an existing crop, a fall planted crop, or a crop that is planted the next spring following University of Maryland recommendations.
 - Poultry litter may be applied in spring and fall for an existing crop or crops planted for the upcoming season, as long as it is applied following University of Maryland recommendations.
 - Applying nitrogen in the fall is prohibited on small grains if a fall nitrate test indicates levels greater than 10 parts per million for wheat or 15 parts per million for barley.
- Cover crops must be planted when organic nutrient sources are applied to fallow ground in the fall.
 - Winter application (December 16 through February 28) of chemical fertilizer is prohibited. **Exceptions exist** for green up of perennial forage crops and small grains as well as greenhouse, cool season grass sod production, and vegetable and fruit production, as long as applications are performed following University of Maryland recommendations.
 - Use of potash and liming materials is **not restricted** in winter.
 - Manure deposited directly by livestock is **not restricted** at any time of year.
 - Manure, biosolids and other organic nutrient sources must be injected or incorporated into the soil within 48 hours of application. **The following conditions may exempt farmers from this requirement:**
 1. The farmer is using no-till farming practices.
 2. Livestock manure is deposited directly by animals.
 3. The land is in permanent pasture.
 4. The land is being used for hay production.





5. Fields are defined as highly erodible land by USDA-Natural Resources Conservation Service (NRCS) Field Office Technical Guide standards and determination protocols. This exemption requires supporting documentation (a Farm Service Agency map or Soil Conservation and Water Quality Plan signed by a soil conservation district representative).
 6. Spray irrigation is being used to apply nutrients to a growing crop.
 7. Small grains have been planted for harvest on the land, either as grain or silage. This is considered a standing crop, and therefore exempt from incorporation of organic nutrient sources during spring green up.
- Nutrient applications are prohibited from December 16 through February 28. This requirement applies to farmers with 50 or more animal units (1 animal unit equals 1,000 pounds of live animal weight).
 - Beginning March 1, 2020, smaller farms with 50 animal units or less must comply with restrictions on applying organic nutrient sources in winter.
 - An emergency provision allows the department to work with farmers on a case-by-case basis to prevent an overflow from liquid manure storage structures during winter, when spreading manure is otherwise prohibited. The exemption is only for on-farm generated manure that the farmer cannot store due to extraordinary circumstances. It does not apply to biosolids or food waste.
 - Farmers seeking an emergency waiver are required to submit proof that they have attempted to obtain adequate manure storage.
 - If approved, farmers must implement environmental protections to safeguard water quality, including the application of manure on vegetative cover and the use of a 100-foot buffer zone next to waterways.
 - Farmers operating under an emergency exemption are prohibited from applying liquid manure if the ground is saturated, snow covered, or hard frozen two inches or more.




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Setbacks for Nutrient Application

A nutrient application setback is a vegetated area ranging from 10 to 35 feet from an eligible waterway where nutrients may not be applied in order to protect water quality. Maryland's nutrient management regulations require setback information identifying these areas to be included on farm nutrient management plans.

Farmers who apply nutrients to their crop fields are required to adhere to the setback distance as determined by the method of application. If nutrients are custom-applied, it is the farmer's responsibility to inform the applicator of the setback requirements. The setback indicator chart shown below may be used to satisfy the Nutrient Management Program's reporting requirements. A map is recommended, but not required.



Maryland Nutrient Management Program Nutrient Application Setback Indicator

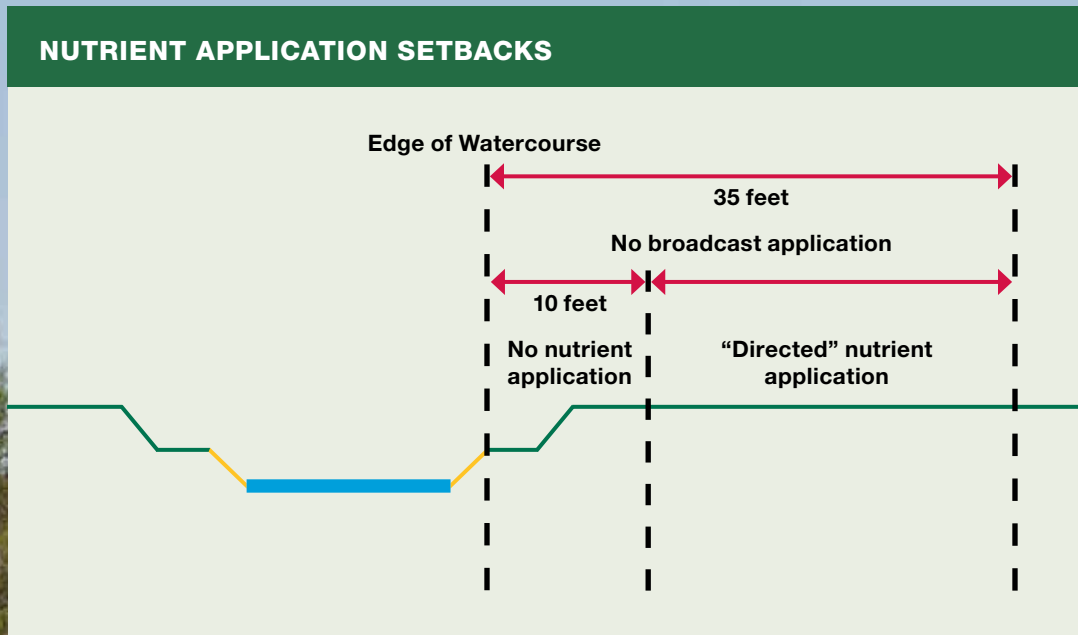
Farm Name(s)	Is Surface Water Present on the Farm that Requires a Setback? (Yes or No)	Field(s) Requiring a Nutrient Application Setback*	Nutrient Application Setback Required (Indicate with "Yes" in appropriate column or columns)		
			Livestock on Pasture ≥ 10 ft.	Directed Application** ≥ 10 ft.	Broadcast Application or Sacrifice Lots*** ≥ 35 ft.

*If a field contains multiple sources of surface water (i.e. a pond and a stream), list each separately or identify on the map.
 **Directed application is a directed spray application (vertical fan or drop nozzle), air flow application, knifed/injected application of nutrients, and planter applied nutrients.
 ***Broadcast application or sacrifice lots: spinner spreaders (manure or fertilizer), high volume horizontal nozzles, and manure spreaders (box type with beaters, splasher plates for liquid, side discharge V-type).

THE FOLLOWING NUTRIENT APPLICATION SETBACK REQUIREMENTS APPLY:

- A minimum 10-foot setback is required for all nutrient applications adjacent to surface waters and streams.
- A 35-foot setback is required when using broadcast fertilizer application methods. No crops may be grown on the 10-foot setback except pasture and hay. The remaining 25-foot setback may have crops, but may not be fertilized unless a direct application method is used.
- Pastures and hayfields are subject to a 10-foot setback.
- Nutrients may not be applied mechanically within the 10-foot setback area.
- Livestock are not allowed in the setback; however, flash grazing is allowed.
- Fencing to control livestock may not be required in all cases. Farmers who do not have stream protection measures in place should contact their soil conservation district to schedule a farm visit. District staff can evaluate the site to determine whether fencing is needed or alternative practices such as watering facilities, livestock crossings, or vegetative exclusion will help protect water quality. The district will provide farmers with the necessary documentation to meet this requirement in preparing their nutrient management plans. If alternative practices do not inhibit access, the department may require fencing.
- Livestock sacrifice lots require a 35-foot setback from surface water.

Use the following charts to determine the length of the setback required:



WHEN DO NUTRIENT APPLICATION SETBACKS APPLY?

If the watercourse is:	It is defined as a:	For crop and pastureland adjacent to the watercourse, a setback is:
Natural and either perennial or intermittent	Stream	Required
Channelized and perennial and : A. Lies within a floodplain soil map unit, or B. Lies within a hydric soil map unit mapped as a narrow, elongated feature in a fluvial (stream-like) floodplain position, or C. Lies within a “B” slope or greater soil	Stream	Required
Channelized and intermittent	Ditch	Not Required
Ephemeral (natural or channelized)	Ditch	Not Required

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Requirements and Best Management Practices for Temporary Manure Stockpiling (Staging)

Temporary field stockpiling (staging) of poultry litter and other dry organic nutrient sources with 60 percent or less moisture content is allowed under Maryland's nutrient management regulations when other immediate use options and alternatives are unavailable. Dry process waste is primarily associated with poultry operations but can also come from swine, beef, or dairy cattle operations. To minimize the duration of temporary field stockpiling, operators should coordinate with integrators to schedule cleanouts as close to spring planting as possible so that crops have a readily available nutrient source when they need it most.

- Manure storage structures should be completely utilized before starting a stockpile.
- Record the date that the stockpile was started.
- Manure in temporary stockpiles must be land applied no later than the first spring following the placement of the stockpile.
- The stockpile area must be:
 - At least 100 feet from any surface water and irrigation or treatment ditches, or 35 feet away if a vegetative buffer is in place.
 - At least 150 feet from wells, springs, and wetlands.
 - At least 300 feet from a well that is down gradient from the stockpile.
 - At least 200 feet from any residence outside the operator's property.
 - Outside flood prone areas and areas prone to ponding.
 - No further than 150 feet from the top of a 3 percent slope with no diversion installed.
- The stockpile must be stacked at least 6 feet high and peaked to allow it to shed rainfall.
- Materials should be stockpiled in a manner that prevents nutrient runoff.
- If the manure stockpile will be exported off the farm, record the date that the manure was shipped along with the name and address of the recipient and an estimate of the tonnage exported.
- Following removal of the stockpile, the ground must be thoroughly scraped or cleaned and the area restored to its original condition. If necessary, reseed the area with grass or an agronomic crop to facilitate nutrient uptake.
- Subsequent stockpiles should be placed in the same location to minimize environmental impact.



SUMMARY: Maryland Nutrient Management Application Requirements



●	Chemical fertilizer may be applied from March 1 through December 15 to an existing crop or a fall planted crop following University of Maryland recommendations.
●	Organic nutrient sources may be applied from March 1 through December 15 to an existing crop. Additional restrictions and conditions for organic nutrients applied in the fall (September 9 through December 15) are described in the Maryland Nutrient Management Manual.
●	Manure, biosolids, and other organic sources of nutrients must be injected or incorporated into the soil within 48 hours of application. There are exceptions for no-till farming systems, spray irrigation on a growing crop, permanent pastures, hay production fields, and highly erodible fields.
●	Fall application of nitrogen is prohibited on small grains if a fall nitrate test indicates levels greater than 10 parts per million for wheat or 15 parts per million for barley.
●	Cover crops must be planted when organic nutrient sources are applied in fall.
●	A minimum 10-foot setback is required for all nutrient applications adjacent to surface waters and streams.
●	A 35-foot setback is required when using broadcast fertilizer application methods. Only pasture and hay may be grown on the 10-foot setback area. The remaining 25-foot setback may have crops, but may not be fertilized unless a direct application method is used.
●	Pastures and hayfields are subject to a 10-foot setback. Livestock are not allowed in the setback area.
●	Livestock stream protection practices are required.
●	Livestock sacrifice lots require a 35-foot setback from surface water.
●	Winter application (December 16 through February 28) of chemical fertilizer is prohibited. There are exceptions for green up of perennial forage crops and small grains as well as greenhouse, cool season grass sod production, and vegetable and fruit production, as long as applications are performed following University of Maryland recommendations.
●	Nutrient applications are prohibited from December 16 through February 28.
●	Beginning March 1, 2020, smaller farms with 50 animal units (1 animal unit equals 1,000 lbs of live animal weight) or less are prohibited from applying organic sources of nutrients from December 16 through February 28.
●	If nutrients are custom-applied, <i>it is the farmer's responsibility to inform the applicator of the setback distance based on the method of application.</i>

Phosphorus Management Tool (PMT)

Maryland's Phosphorus Management Tool (PMT) regulations took effect June 8, 2015 and provide a multi-year process for farmers to transition from the Phosphorus Site Index to the PMT, an updated tool that uses the best available science to identify the potential risk of phosphorus loss from farm fields and prevent the additional buildup of phosphorus in soils that are already saturated. Soils with high phosphorus levels are typically found on farms that have used manure or poultry litter as a crop nutrient over an extended period of time.

Fertility Index Value (FIV) is a measurement of phosphorus in the soil as determined by a laboratory test of a soil sample. A level between 51-100 is considered "optimum" for crop production. FIV levels above 100 indicate that the soil contains more phosphorus than the crop needs. It is important to remember that ***use of the PMT only applies to farm fields with high soil phosphorus levels identified by a Fertility Index Value of 150 or greater. If farm fields score less than 150 FIV, farmers may apply phosphorus to the land following University of Maryland recommendations outlined in the Maryland Nutrient Management Manual.***

● NOW IN EFFECT

- Fields with the greatest risk for phosphorus runoff into nearby waterways as indicated by a Fertility Index Value of 500 or greater are banned from receiving additional phosphorus. This ban remains in effect until the Phosphorus Management Tool is fully implemented in 2022. After that, potential phosphorus applications on these fields will be determined by the PMT. These farms receive priority for cost-share assistance to relocate excess animal manure.
- All new/updated nutrient management plans must be developed using both the Phosphorus Site Index and the new Phosphorus Management Tool for farm fields with a Fertility Index Value of 150 or greater. By running both the Phosphorus Site Index and the Phosphorus Management Tool, farmers will be better informed and can plan for management changes that will be required by the new regulations.

● PMT SCHEDULING TIERS

(Tiers Determine When Farmers Must Transition to the Phosphorus Management Tool)

- **High-Risk Tier C Farms**—These farms have average phosphorus levels greater than 450 FIV*. Tier C farms begin to phase in implementation of the PMT in 2018 and have until July 1, 2022 to fully transition. Phosphorus applications are incrementally lowered during the phase-in period.
- **Medium-Risk Tier B Farms**—These farms have an average phosphorus level of 300-450 FIV*. Tier B farms begin to phase in implementation of the PMT in 2019 and have until July 1, 2022 to fully transition. Phosphorus applications are incrementally lowered during the phase-in period.
- **Low-Risk Tier A Farms**—These farms have an average phosphorus level of 150-299 FIV*. Tier A farms begin to phase in implementation of the PMT in 2020 and have until July 1, 2022 to fully transition. Phosphorus applications are incrementally lowered during the phase-in period.

**Average of all fields with a Fertility Index Value greater than 150*

● SPECIAL PROVISIONS AND CONSIDERATIONS

The following special provisions allow farmers to apply phosphorus to crops when it would otherwise be restricted by the PMT. For additional guidance, farmers should contact their nutrient management consultant or regional nutrient management specialist.

- **Tissue Analysis**—Crop tissue, such as the leaves of a corn plant, may be analyzed as an indicator of crop health and nutrient deficiency. If a phosphorus deficiency is indicated, farmers may add phosphorus to the crop following University of Maryland recommendations.
- **High Phosphorus Crops**—Vegetable and tobacco crops with proven higher phosphorus needs may receive phosphorus applications at planting.
- **Organic Crops**—Certified organic farmers who rely on animal manures as a source of both nitrogen and phosphorus for crop production may apply limited amounts of phosphorus under certain conditions.
- **Alternative Use**—Farmers adopting Maryland Department of Agriculture-approved alternative use technologies to lower the phosphorus content in animal manure may apply limited amounts of phosphorus.

TIMELINE: Implementing Maryland's Phosphorus Management Tool Regulations



EFFECTIVE DATE	REQUIREMENT
NOW IN EFFECT	Fields with the greatest risk for phosphorus runoff into nearby waterways as indicated by a Fertility Index Value (FIV) of 500 or greater are banned from receiving phosphorus.
	All new/updated nutrient management plans are developed using both the Phosphorus Site Index and the new Phosphorus Management Tool for farm fields with an FIV of 150 or greater. Management requirements for the Phosphorus Site Index govern phosphorus use.
	Beginning in 2016 and every six years thereafter, soil test phosphorus data will be submitted for all farms in Maryland subject to nutrient management plan requirements. This data will provide the Maryland Department of Agriculture with accurate soil fertility data to monitor trends in phosphorus levels and help identify potential areas to redistribute newly available manure.
2018	New phosphorus management requirements begin to phase in for High-Risk (Tier C) farms with average phosphorus FIV that is greater than 450.
2019	New phosphorus management requirements begin to phase in for Medium-Risk (Tier B) farms with average phosphorus FIV of 300-450.
2020	New phosphorus management requirements begin to phase in for Low-Risk (Tier A) farms with average phosphorus FIV of 150-299.
2022 July 1	The Phosphorus Management Tool is fully implemented on all fields with an FIV of 150 or greater (unless the deadline is extended).

MARYLAND DEPARTMENT OF AGRICULTURE Nutrient Management Offices

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Allegany, Garrett and Washington counties

12407 Naves Cross Road, NE
Cumberland, MD 21502
301-777-1747, ext. 116

Carroll and Frederick counties

92 Thomas Johnson Drive, Suite 110
Frederick, MD 21702
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CENTRAL AND SOUTHERN MARYLAND

Anne Arundel, Howard and Montgomery counties

92 Thomas Johnson Drive, Suite 110
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Baltimore, Cecil and Harford counties

2205 Commerce Road, Suite C
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Calvert, Charles, Prince George's and St. Mary's counties

26737 Radio Station Way, Suite B
Leonardtown, MD 20650
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EASTERN SHORE

Caroline and Dorchester counties

28577 Mary's Court, Suite 4
Easton, MD 21601
410-822-8120

Kent, Queen Anne's and Talbot counties

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Easton, MD 21601
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Somerset, Wicomico and Worcester counties

27722 Nanticoke Road, Unit 2
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FOR MORE INFORMATION on Maryland's nutrient management regulations, [click here](#) or visit mda.maryland.gov and type "Maryland Nutrient Management Manual" in the search box.



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