

Nutrient Management Cost Estimates
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Table 1. Nutrient Management Effectiveness and Costs						
Name	N load % reduction	P load % reduction	Cost/acre/year (\$2010)			Comments
			Capital	O and M	Annualized cost	
Tier 1	9.25	10.0	75	-15.50	11.69	High till, low till with manure
Tier 1	5.0	8.0	75	-15.50	11.69	High till w/o manure. Alfalfa & other hay with nutrients,
Tier 2N*	4.4			18.77	18.77	High till with manure
Tier 2N*	4.4			68.00	68.00	Low till with manure
Tier 2N*	2.8			8.00	8.00	Hay with nutrients
Tier 2P*		6.6	75	-15.50	11.69	High till, low till with manure, alfalfa & other hay with nutrients
Tier 3N*	2.8			1.00	1.00	High till, low till with manure

*Higher tier credits assume that lower tier practices are in place.

Tier 1--Crop Group Nutrient Application Management

Includes the following four planning components: (1) standard, realistic farm-wide yield goals; (2) credit for N sources (soil, sod, past manure and current-year applications); (3) P application rates consistent with LGU [land grant university] recommendations based on soil tests for fields without manure; and (4) N-based application rates consistent with LGU recommendations for fields receiving manure. (Nutrient Management Expert Panel, 2015, p. 13)

Cost: \$11.69/year/acre (Devereux and Rigelman, 2015, Row 149)

Tier 2--Field Level Nutrient Application Management

“Indicators demonstrating implementation of this practice includes the presence of a plan that addresses the four elements described above [Tier One], plus practices such as but not limited to best N application timing, manure incorporation where appropriate, PSI application, and manure application setbacks. Credit for this practice is based on how the plan integrates such practices to provide an overall reduction in N and P losses, whereas elements of N loss reduction can be implemented and credited separately and distinctly from P in the Chesapeake Bay Program’s Watershed Model. Therefore three reporting classes are recommended: Tier 2 N, Tier 2 P, and Tier 2 N&P.” (Nutrient Management Expert Panel, 2015, p. 13)

Tier 2N, the difference relative to Tier 1 is the use of best N application timing, manure incorporation where appropriate, and manure application setbacks.

Cost: Manure incorporation—Cost varies depending on how incorporation is achieved. Dairy or poultry manure injection is consistent with low till and costs \$60/acre (Devereux and Rigelman, 2015, Rows 91, 92). However, incorporation with a disk harrow is consistent with high till and would likely cost \$10.77/acre (Virginia Cooperative Extension Budgets, 2007 estimates updated to 2010 \$ using GDP deflator).

Splitting N applications—VA DCR reimburses up to 75% of cost or \$6/acre implying that total cost is \$8/acre (D. Kindig, 2015).

Cost for high till with manure = $\$10.77 + \$8 = \$18.77$

Cost for low-till with manure = $\$60 + \$8 = \$68$.

Cost for hay with nutrients (no manure) = \$8

Tier 2P, the difference relative to Tier 1 is the use of PSI.

Cost: costs for PSI not readily available. The \$11.68/acre/year cost for basic nutrient management is used here.

Tier 3—Adaptive Nutrient Management for N

In addition to Tier 2 practices, Tier 3 requires at least one of the following: Illinois Soil Nitrogen Test (ISNT), Corn Stalk Nitrate Test (CSNT), Pre-side dress Nitrate Test (PSNT), Fall Soil Nitrate Test (FSNT), or Variable N rate application as well as changes in N application rate/timing in response to information from the test (Nutrient Management Expert Panel, 2015, p. 13).

Cost: \$1/acre/year. Cost share in Virginia is available for up to \$8 per sample for lands where organic sources of N have previously been applied (D. Kindig, 2015). Samples should represent from 7 to 20 acres. Cost estimate assumes 8 acres per sample.

References

Devereux, O. and J. Rigelman. 2015. VirginiaDefaultCosts_BmpCosts. Excel spreadsheet. Annapolis, Maryland.

Kindig, David. 2015. Split Application of Nitrogen on Corn Using Pre-Sidedress Nitrate Test to Determine Need for Sidedress Nitrogen When Organic Nitrogen Sources Have Been Previously Applied. Virginia Department of Conservation and Recreation, Richmond, Virginia. DCR Specification for No. NM-3C. Available at http://dswcapps.dcr.virginia.gov/htdocs/agbman/BMPs/NM-3C_2016.pdf. Accessed December 14, 2015.

Nutrient Management Expert Panel. 2015. Nutrient Management: Recommendations for Approval by the Water Quality Goal Implementation Team's Watershed Technical and Agricultural Workgroups. Phase 5.3.2. Chesapeake Bay Program. Annapolis, Maryland.

Virginia Cooperative Extension. 2007. 2007 Tractor and Machinery Combinations Costs Per Acre. Available at <http://pubs.ext.vt.edu/446/446-047/446-047.html>. Accessed December 14, 2015.