

Calculating Manure Application Rates When Planning With the Manure Management Plan Workbook

When using the Manure Management Plan Workbook to complete a Manure Management Plan, you are required to include the manure application rates for the operation. There are multiple methods to calculate manure application rates.

Nutrient Balance Sheets

A Nutrient Balance Sheet is a tool that can be used to determine the most agronomically appropriate manure application rates. Nutrient Balance Sheets or the PAOneStop Manure Management Planning Modules should be used by any operation that applies commercial fertilizers, biosolids, and food processing residuals.

There are two tools available to calculate manure application rates using Nutrient Balance Sheets: The Word version and the Excel version. Both are available at <https://extension.psu.edu/programs/nutrient-management/tools/sheet>. The Word version requires the planner to complete calculations similar to filling out a tax form by hand. The excel version completes the calculations for the planner if the inputs are entered correctly.

Word Nutrient Balance Worksheet

Nutrient Balance Worksheet
Version 7.0 - October 2023

Crop Group: _____ Yield: _____ CWS#/Field Identification (this text must be clearly identified on a map): _____ Acres: _____

OPTION 1 P Removal
• P removal rates
• 100 application setback from streams, lakes or ponds
• No winter application
• Use the P₂O₅ column to determine acceptable rate
• Completion of N column required for all options. P₂O₅ column is optional for N based rates. K₂O is optional for all rates.

OPTION 2 N Requirement
• N requirement rates
• 100 application setback from streams, lakes or ponds
• Soil test < 200 ppm Mehlich 3 P
• No winter application
• Use the N column to determine acceptable rate
• Soil Test Mehlich 3 P (ppm)

OPTION 3 P Index
• P index evaluation of fields
• P Index and Winter Matrix required for winter application
• Use appropriate column based on the P index to determine acceptable rate

Manure Group: _____ Manure Type (Poultry, Swine, Other, Compost): _____ Application Season: _____ Application Management: _____

Units (Circle): _____ Manure Analysis: _____ Manure % Solids: _____
lb/ton or lb/1000 gal: _____ NH₄-N: _____ Organic N: _____ P₂O₅: _____ K₂O: _____

Notes: _____

Recommendation Basis

A) Recommendation or Removal (lb/A)
B) Fertilizer Applied (lb/A)
C) Other Organic Sources Applied (lb/A)
D) Residual Manure N (lb/A)
E) Previous Legume N (lb/A)
F) Net Nutrient Requirement (lb/A)
G) Manure Analysis (lb/ton or lb/1000gal)
H) Nitrogen Availability Factors
I) Available Nitrogen Fractions (lb/ton or lb/1000gal)
J) Total Available Nitrogen
K) Balanced Manure Rate (ton or gal/acre)
L) Planned Manure Rate (ton/A or gal/acre)
M) Nutrients Applied at Planned Rate
N) Nutrient Balance at Planned Rate

Excel Nutrient Balance Worksheet

Option 1 P Removal
Option 2 Nitrogen Based
Nutrient Balance Sheets

Crop Group Identification: _____

Fields: _____
Acres: _____

NBS Option: _____
Mehlich 3 Soil Test P: _____ ppm P
Option 1 P removal: Not needed
Option 2: Enter maximum soil test for fields: _____ ppm P

Crop: _____
Planned Yield: _____

Crop Removal Recommendations (lb/A): N P205 K2O N P205 K2O

Soil Test Recommendation (lb/A): _____
Other Nutrients Applied (lb/A): _____
Nutrients applied regardless of manure: _____
P Index Application Method: _____
Double Crop Carry Over N (lb/A): 0 0
Manure History Description: _____
Residual Manure N (lb/A): _____
Legume History Description: _____
Residual Legume N (lb/A): _____
Net Nutrients Required (lb/A): _____

Manure Group: _____

Manure Nutrient Content (lb/ton or 1000 gal): Total N P205 K2O N P205 K2O

Application Season Management (incorporation, cover crops, etc.): _____

Availability Factors: _____ NH₄-N Org N Total N NH₄-N Org N

N Balanced Manure Rate (ton or gal/acre): _____
P Removal Balance Manure Rate (ton or gal/acre): _____
Crop P Removal (lb/A): _____
Crop P Removal (lb/A): _____

Planned Manure Rate (ton or gal/acre): _____
Nutrients Applied at Planned Manure Rate (lb/A): _____
Nutrient Balance after Manure: _____
Supplemental Fertilizer (lb/A): _____
P Index Application Method: _____
Final Nutrient Balance (lb/A): _____

Multiple Application: _____
Soil test or Crop Removal: _____

PAOneStop Manure Management Planning Module

As an alternative, the planner may choose to complete the full Manure Management Plan Workbook and manure calculations using the PAOneStop Manure Management Plan Module which can be found at <https://paonestop.psu.edu>.

Manure Application Rate Tables

Operations that do not utilize commercial fertilizers, biosolids, or food processing residuals, are growing the crops listed, and applying the manure types listed may utilize the phosphorus-based manure application rate tables of Appendix 1 of the Land Application of Manure Technical Guidance Manual which can be found on DEP's eLibrary at <https://greenport.pa.gov/elibrary/GetFolder?FolderID=1114203>. Operations that wish to apply nutrients beyond the phosphorus removal rate, on crops not listed in Appendix 1, or utilize manure types not listed in Appendix 1 must utilize Nutrient Balance Sheets or the PAOneStop Manure Management Planning Module to determine the planned application rate of manure.