

or nutrient credits. The third column provides the percentage of the test parameter for that sample. This percentage represents the nutrient content for that sample on a wet weight basis, not a dry matter basis, because manure is applied "as-is." The fourth column indicates the date the sample analysis was performed. The fifth column lists the test method used for the determination of that particular test parameter. The sixth column lists the method detection limit for the test method used. The units for the method detection limits are in parts per million, not the same as the percentage units in column three.

The third section includes estimates of nutrient availability for nitrogen, phosphorous, and potassium. This section takes the sample results and converts them to units you can use on the farm. For example, if there are 52 lbs/ton of P_2O_5 (phosphate) and you apply 2 ton per acre, you have applied 104 pounds of P_2O_5 (2×52 lbs./ton). The amount of organic nitrogen that will mineralize during the first year is the organic nitrogen multiplied by a mineralization factor. The mineralization factor is the amount of organic material that is converted to an inorganic form by soil microbes. The total plant available nitrogen can be calculated by adding the ammonium nitrogen value from the manure analysis to the organic nitrogen available the first year. Nitrogen availability is based on animal species, manure storage and handling system, application method and timing, days until manure incorporation, and other factors. Practically all of the phosphate (P_2O_5) and potash (K_2O) in manure is available to the crop the same as supplied by fertilizer. A key element in application management is incorporating the manure immediately after it is applied. This practice will prevent ammonia loss to the atmosphere which reduces the value of the manure.

Using the Information from a Manure Analysis

The information on the manure analysis is only one part of the information needed to ensure proper nutrient application. You will also need to know the crop nutrient needs (Figure 1) from a soil analysis. The following tables can help in calculating the amount of manure required to meet crop needs.

<u>Nutrient</u>	<u>lbs. needed/acre</u>
N	60
P_2O_5	40
K_2O	80

Figure 1: Example of soil test recommendations.

<u>Nutrient</u>	<u>lbs./ton of manure</u>
Nitrogen (TKN)	31
Ammonium nitrogen	17
Phosphate (P_2O_5)	59
Potash (K_2O)	56

Figure 2: Example of manure analysis.

<u>N form</u>	<u>lbs./ton</u>	<u>% available</u>	<u>lbs. available</u>
Ammonium	17	100	17 lbs./ton
Organic N (total N minus ammonium)	14	50	7 lbs./ton
Total N available			24 lbs./ton

Figure 3: Total and available nitrogen.

<u>Nutrient need</u>	<u>divided by</u>	<u>Nutrient content</u>	<u>Rate to apply</u>
60 lb. N/acre	/	24 lb. N/ton	2.5 ton/acre
40 lb. P_2O_5 /acre	/	59 lb. P_2O_5 /ton	0.7 ton/acre
80 lb. K_2O /acre	/	56 lb. K_2O /ton	1.4 ton/acre

Figure 4: Rate of application.

Since nitrogen is commonly the most limiting nutrient for crops such as corn, the rate actually applied is determined by the nitrogen requirement. From the information above, this means that the P_2O_5 will be over-applied by 106 lbs./ton and the K_2O will be over-applied by 61 lbs./ton. In the long term, this nutrient overload can lead to the manure only supplying nitrogen for the crop while wasting the P and K that could be used on another area. This is why a good knowledge and understanding of a manure nutrient analysis is important in applying conservation practices on the farm. The goal of manure nutrient management is to maximize the dollar value of this resource, while at the same time reducing its potential as a contaminant.

For more information, contact:
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Understanding Manure Analysis



Ensure proper nutrient application and prevent overapplication.



Gus R. Douglass,
Commissioner

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Understanding Manure Analysis

Introduction

The West Virginia Department of Agriculture's (WVDA) manure analysis report is designed to provide the information needed to calculate manure application rates. It is becoming increasingly important to have current manure nutrient information available. Being aware of the nutrient content of the manure can help landowners take advantage of this valuable resource. There tends to be a considerable amount of nutrient variability from farm to farm depending on different management practices. By repeatedly using an "average" value, landowners may be applying more nutrients than originally intended. If landowners underestimate nutrient content, over application can occur creating a nutrient build-up over time. If landowners overestimate nutrient content, they deprive the crop by not supplying the nutrients it requires for optimal growth, thus risking lower yield. Being aware of the nutrient content of manure can help prevent over application which can lead to ground and surface water pollution.



Reading the Manure Analysis

WVDA's Laboratory Analysis Report is divided into three sections. The first, or top portion of the page, is descriptive information about the customer, including customer identification and the person or agency that submitted the sample, sample identification and description, and the date the sample was collected, received by the lab, and when the results were reported. The information provided on the sample submission form is essential for the laboratory to provide accurate results.

The second section of the report contains the analytical results. This section is divided into six columns. The first column lists the test parameter (e.g. Nitrogen (TKN)). The second column provides the result of the test in pounds per ton or pounds per thousand gallons, depending on whether the sample is in liquid or solid form. The percent value is converted to pounds per ton for the purpose of calculating application rates

LABORATORY ANALYSIS REPORT

WVDA Nutrient
Management Lab
Moorefield Field Office
60B Industrial Park Road
Moorefield, WV 26836
304-538-2397

Date Received: June 28, 2005
Date Sampled: June 22, 2005
Date of Report: July 1, 2005

Submitted by: NRCS
223 North Main Street
Moorefield, WV 26836

Land Owner: John Smith
or Operator: Rt. 2 Box 1910
Somewhere, WV 10002

Sample ID Number: 06250501
Sample Description: Broiler litter

Test Parameter	lbs/ton	%	Test date	Method	MDL
(N)Nitrogen (TKN)	53.63	2.68	7/1/2005	351.3 EPA	0.372
(P)Phosphate (P205)	47.91	2.39	6/30/2005	365.2 EPA	0.017
(K)Potash (K20)	51.71	2.58	6/30/2005	3111B STM	0.109
*Moisture	****	30.07	6/30/2005	2540 STM	0.831
Ammonia	14.27	0.74	6/30/2005	350.2 EPA	0.032
C:N Ratio	21.25	***	7/1/2005	*****	***
Copper	0.631	0.0315	6/30/2005	3111B STM	0.011
Calcium	42.10	2.11	6/30/2005	3111B STM	0.236
Magnesium	8.89	0.44	6/30/2005	3111B STM	0.028

*Calculations based on Total Solids

**Not a certifiable method

When surface applied this sample will
supply plant available:

Nitrogen (N) 19.40 lbs/ton
Phosphate (P205) 47.91 lbs/ton
Potash (K20) 51.71 lbs/ton

Additional nitrogen is available 14.27 lbs/ton if incorporated or injected immediately.

Approved By _____