

# Manure Resources

Using manure as a resource.

## Use manure as a nutrient source.

Each year, Iowa livestock producers recover enough crop-available nitrogen (N), phosphorus (P) and potassium (K) in manure to supply approximately 13 pounds of N, 13 pounds of P and 21 pounds of K for every acre of corn grown in Iowa.

Most producers understand that manure is a resource rather than a waste product. Since efficiently recycling manure nutrients can reduce reliance on fertilizers, applying manure using scientifically sound methods is like putting money in your pocket.

To realize the full value of manure requires your taking a few moments and working through some simple steps.

- Test the nutrient concentration of manure.
- Soil test and apply manure where it is needed, based on crop N, P, or K needs.
- Calibrate the manure applicator for a known and even distribution of manure.

## Analyze manure before applying and build an analysis database.

Have a commercial laboratory determine the concentration of nutrients in the manure. Manure samples should be taken before application to help guide application rates. Multiple samples also should be collected during application to build a manure nutrient database. These analyses help manage the manure with the same care as the care you use with fertilizer.

### Key Points

- Use manure as a nutrient source.
- Analyze manure before applying and build an analysis database.
- Apply manure where it is needed, according to nitrogen (N), phosphorus (P), or potassium (K) crop needs, soil test data and your manure management plan.
- Calibrate manure applicators.
- Contact your Iowa State University county Extension office for more information.

Manure consists of both solids and liquid, so one sample may not represent the overall nutrient value. For example: pits become stratified, with solids concentrated at the bottom. To get a sample of the average nutrient content, probe the full depth of the pit several times and combine into a composite sample. Or, agitate the manure vigorously for several hours before sampling. Sample while the agitator is running or

**Table 1. Interpretation of P and K soil test values for surface soil samples (6 to 7-inch depth).**

Relative level*	Bray P <sub>i</sub> or Mehlich-3 P			Olsen P			Ammonium Acetate or Mehlich-3 Extractable K	
	Wheat, Alfalfa	All crops except wheat, alfalfa		Wheat, Alfalfa	All crops except wheat, alfalfa		All Crops	
	Subsoil P			Subsoil P			Subsoil K	
	Low	High		Low	High		Low	High
	parts per million (ppm)							
Very Low (VL)	0-15	0-8	0-5	0-10	0-5	0-3	0-60	0-40
Low (L)	16-20	9-15	6-10	11-14	6-10	4-7	61-90	41-80
Optimum (Opt)	21-25	16-20	11-15	15-17	11-14	8-11	91-130	81-120
High (H)	26-30	21-30	16-20	18-20	15-20	12-15	131-170	121-160
Very High (VH)	31+	31+	21+	21+	21+	16+	171+	161+

From PM 1688, General Guide for Crop Nutrient Recommendations in Iowa.

when the spreader is being loaded.

If you feed on an open lot, scrape across the lot with a shovel to get a composite sample.

Getting a uniform sample is difficult, but doing the best job you can means using a consistent and meticulous approach to sampling.

If management and feed rations do not change, manure analysis should remain fairly stable. But samples should still be taken every year. Maintain these manure analysis records, and build an analytical nutrient management database. Document the date, location, soil condition, and source and amount of manure applied to fields.

### **Apply manure where it is needed, according to N, P, or K needs, soil test data and your manure management plan.**

Use a current soil test analysis from a certified laboratory. Have

a certified crop advisor or independent crop consultant assist you in developing a nutrient management plan for each field. Table 1 will help you understand which fields or field areas to target for manure application.

The optimum soil test category is the most profitable to maintain. The very high soil test category indicates that the nutrient concentration exceeds crop needs, and further additions of that nutrient very seldom produce a profitable yield response.

Applying manure in fields where fertility levels are very high wastes a valuable resource, and repeated applications will result in a rapid increase in soil test P and potassium (K).

Consider the needs of the crops in rotation, and allocate manure to fields based on the N, P, or K requirements of the crop to be planted. A suggested manure allocation strategy is:

First, fields testing very low, low, or optimum in P and K that will be planted to corn.

Second, fields testing very low, low, or optimum in P and K that will be planted to soybeans.

Third, fields testing high to very high in P and K that will be planted to corn.

Note: To slow nitrification, do not apply manure in the fall until the soil temperature is 50 degrees F at a depth of four inches and cooling. Injection of manure is preferred over broadcast application.

### **Calibrate manure applicators.**

Since livestock manure is a resource and is applied to cropland for its nutrient value, getting an even spread of manure is important. Correct manure applicator calibration, operating speed and even application

throughout the field is as important as properly sampling the manure.

From the laboratory analysis, calculate the nutrients to be applied in pounds or gallons per acre.

Field-calibrate your applicator. Assistance may be obtained from a certified crop advisor, independent crop consultant, or an ISU Extension crop or agricultural engineering specialist.

## **Contact your ISU county Extension office for more information.**

Publications available to help you manage manure include:

PM 1558, *Management Practices: How to Sample Manure for Nutrient Analysis*

PM 1811, *Managing Manure Nutrients for Crop Production*

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Best Management Practices, or BMPs, utilize the most effective and practical means available to reduce or prevent water pollution from farm operations. BMPs are selected based on assessment, analysis of the impact of alternative practices and their economic considerations. They are implemented using current available technologies, management skills and available resources. BMP information sheets available from ISU Extension include:

NMEP 1, *Soil Testing*

NMEP 2, *Phosphorus Application*

NMEP 3, *Manure Resources*

NMEP 4, *Residue Management*

NMEP 5, *Crop Rotation*

NMEP 6, *Crop Yields*

NMEP 7, *Nitrogen Application*

NMEP 8, *Nutrient Management Plan*

NMEP 9, *Equipment Calibration*

NMEP 10, *Conservation Reserve Program*

NMEP 11, *Conservation Practices*

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