

MANURE AS A PLANT NUTRIENT

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ABSTRACT

There are many uses for manure, each dependent on the structure of the operation. The most common use for manure is a nutrient supply for plants. Manure, used as a fertilizer, can be cost efficient and feasible when the proper management techniques are implemented. The tools and techniques needed in order for manure to serve this purpose will be discussed, along with their challenges.

INTRODUCTION

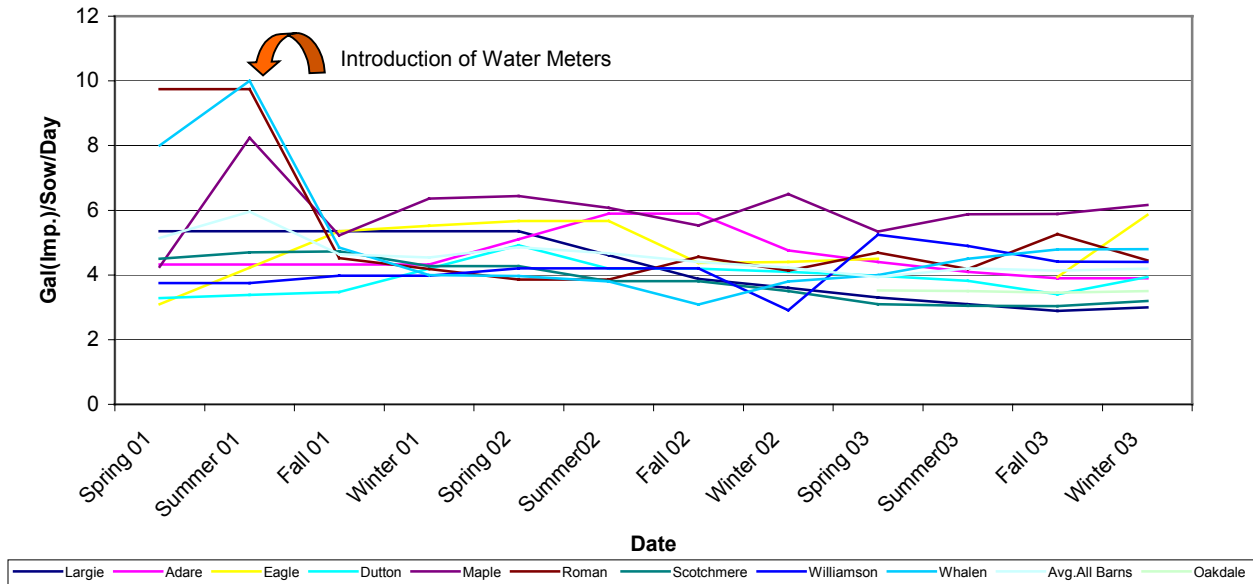
Manure is a bio-product that should be considered as an asset. Manure can be used as a fertilizer, converted to make gas, electricity, compost, recycled into re-useable water or an organic fertilizer. Every operation has different potential uses for manure, depending on their individual operations. Decisions on how best to utilize the manure produced by your operation and feasible solutions can be found within the organization, Advance Manure Management Technologies for Ontario (AMMTO). AMMTO tests and provide ratings on various manure technologies.

The most economical use for Premium Pork, is to utilize manure as a fertilizer. The highly diluted nature of sow manure (0-2% dry matter), the most common manure in our Canada operations makes the choices somewhat limited for the 85,000,000 gallons of manure produced each year. This highly diluted aspect of sow manure encourages continual discovery to economize on manure application. This includes optimum nutrient utilization, water management, transportation, and minimizing manure production.

WATER CONSUMPTION

The amount of manure produced is directly correlated with water usage. Premium Pork has installed water meters in farrowing and gestation rooms in all of their sow barns (Figure 1). Targets are set at 5.5 imp.gal/sow/day in farrowing and 2.42 imp.gal/sow/day in gestation based on the National Swine Water Consumption Guidelines. Timers, regulators and manifolds, along with proper management, are leading the company to reach the appropriate guidelines.

Figure 1. Gallons/sow/day of manure in Premium Pork sow barns (Ontario).



UTILIZING THE NUTRIENTS

Benefits of manure include not only the nutrients N, P, K, but also, micro-organisms and organic matter. An average manure application has an economic value of \$50.45/ac. A great tool in utilizing your nutrients to their fullest potential is the pre-nitrogen test. This soil-sample test is performed after you plant your corn crop, usually May/June, and based on the lab results the NH₃ rate can be adjusted accordingly. This allows you to properly optimize your nutrient application economically and environmental. Experiments have shown that the timing of planting has a greater effect on profitability than the value of the manure when postponing the planting date. A study was conducted in which one field did not receive manure but was planted 3 weeks earlier than the field across the road, which did receive manure. It concluded that the earlier field yielded 54 bu/ac more. The net result was \$3.00/bu/corn x 54 bu/acre = \$162/acre - \$50.42/acre manure benefit = \$111.55/acre.

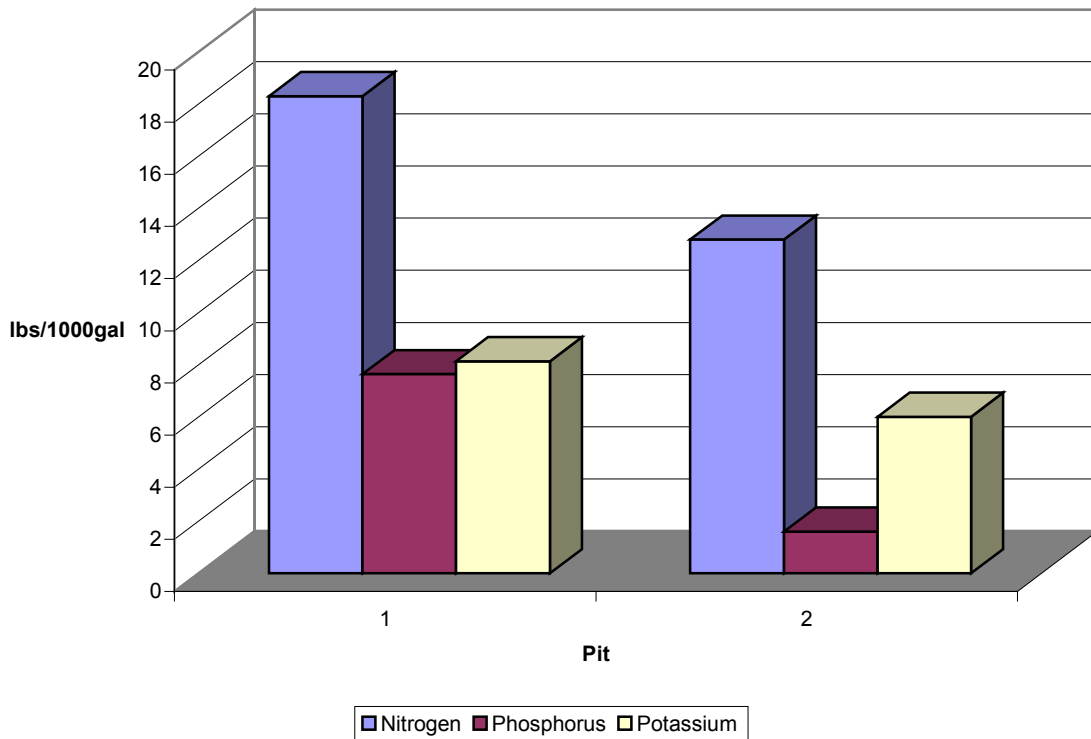
The study concluded that it is better to get the crop into the ground early as opposed to holding off planting until the manure is spread if possible. A solution could be to plant the crop at the optimum time and then drag line over the planted crop. The hose does not seem to jeopardize the seed bed, and no major crusting appears to occur.

REDUCING TRANSPORTATION COST

Newer barns are equipped with the primary/secondary pit overflow. In this system, the manure runs from the barn to the primary pit. Once the primary pit is close to full, it flows over to the secondary pit near the top. This leaves highly diluted manure in the secondary pit

with low nutrient values, and highly concentrated manure in the primary pit (Figure 2). In situations where there are fields varying in distance from the barn, the highly concentrated manure would be transported to the far land base and the land surrounding the barn would receive a higher application rate of manure from the secondary pit, as the Nutrient Management Plan allows.

Figure 2. Average N, P and K levels in pit 1 and in pit 2.



CONCLUSIONS

Manure as a fertilizer is a valuable nutrient within the confines of a proper agronomic setting when the proper management tools and techniques are implemented. Economic value and cost savings can be realized. New manure technologies will continue to be offered and are looked at with hope and optimism.

In the interim the highest and best use for manure in Premium Porks sow units is to employ it as a crop nutrient and return it back to the soil from whence it came from. Manure is an integral part of the created circle of life.

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