

MANURE BROKERAGE IN OHIO

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ABSTRACT

In Ohio there are several counties where annual manure production exceeds the requirements of all crops grown in the county. Poor distribution of this manure has created instances where soils have become overloaded with phosphorus, contributing to the phosphorus load of surface waters and creating the potential for long term release of phosphorus into states waters. Nitrogen also becomes an environmental concern as excess nutrient loads are placed on soils, nitrogen is found leaching through tile lines into surface waters, or in some cases directly into ground water. This situation has drawn the attention of agencies like the Ohio Water Development Authority (OWDA), who in cooperation with the Ohio Department of Natural Resources (ODNR) appropriated funds to fuel the development of a program geared toward more effective distribution of animal manures, hence the manure brokerage program was initiated in the Spring of 1993. Ohio State was then asked to participate in choosing the "brokers", assessing the cost/benefit, and educating manure producers and potential users of benefits and/or hazards of land application of animal wastes.

Significant pollution potential is commonplace on many of the livestock farms in Ohio. Many of these farms specialize in livestock production and end up importing feed and/or bedding from farms other than their own. The resulting excess nutrient situation then becomes a waste management problem to the livestock producer. On the other hand, more than 50% of Ohio farmers have no livestock, producing only grain for the commercial market. As a result of the sale of grain, approximately 1 lb N, 0.37 lbs P₂O₅, and 0.27 lbs K are removed from the farm for every bushel of corn produced. For soybeans the nutrients removed are approximately 4 lbs N, 0.8 lbs P₂O₅, and 1.4 lbs K₂O per bushel. To maintain soil fertility levels farmers must in turn replace lost nutrients. Usually nutrient replacement is done via application of commercial fertilizers by an agricultural fertilizer and chemical dealer.

Since the fertilizer dealer is an integral part of the farmer's soil fertility program, often offering soil testing services and fertility management recommendations, it follows that he would be a key influencer on farmer acceptance of an alternative soil fertility system. Two agricultural fertilizer and chemical dealer's proposals were selected out of nine to receive grant monies to work in the Manure Brokerage program. One dealership is a cooperative and the other is an independent. Both proposed a three year program and were selected because of their proximity to a potential pollution problem, and because of their commitment to making it work.

PROCEDURE

The dealer, in cooperation with state staff identifies and establishes a working relationship with local livestock producers who have excess manure on their farms. The dealer analyzes the quantity and nutrient content of the manure and determines safe application rates for the generating farm while estimating how much manure can be sold to grain farms within an economic haul distance. The dealer develops a list of grain farms within his territory that are willing to accept and utilize manure as a part of their annual fertility program. He is responsible for spreading the manure as well as the quantity and quality of all nutrients supplied from the livestock manure. He will maintain records on soil nutrient levels of participating farms as well as the amount of manure applied and crop yields. He also agrees to share information summarizing the relative fertilization costs.

In order for the fertilizer dealer to get involved in a new endeavor like manure brokerage, he must have some financial incentive. Grant monies were used by the two dealerships to offset soil & manure tests, hauling, spreading & loading, manure purchase, labor, and miscellaneous expenses. The cost of additional equipment was incurred by the dealer.

RESULTS TO DATE

Although we are still in the beginning stages of this program, we have seen a couple of trends developing. One, the dealers seem to be attracted to poultry manure rather than manure from cattle or hog operations, mainly because of its high nutrient values. Secondly, dealers prefer a fine textured dry manure because it is easy to spread through fertilizer trucks equipped with spinner spreaders. The dry manure doesn't "cake" and doesn't cost as much to haul because it is not carrying as much water. The fertilizer "spinner" spreaders cover a wider area with a more even pattern and less wheel traffic than does a manure box. It is a challenge however to find manure with a fine/dry consistency. For manures with less than ideal consistency a more conventional spreader is necessary, one dealership is considering purchasing a pusher type box which will even handle wet manures.

One dealership has been working primarily with a single manure source (broiler chickens) and has distributed that onto two farms. The other dealer has taken manure from six different producers (layers to broilers) and distributed it onto ten different farms. In both cases the dealers have preferred the manure from broiler houses because it is dryer and less dense than manure from layer houses, or for that matter any other source. High quality manure can fetch prices of up to \$2.50/ton paid to the poultry producer. This is a big turn-around from having manure that is looked at as strictly a waste problem. On the other hand, manures that are wet and inconsistent will probably be difficult for the livestock producer to even get into the brokerage program. The following page illustrates some of the economic differences that exist when looking at manure as a competitor in the fertilizer business.

So far, farmer acceptance of manure as a commercial fertilizer replacement is not a problem for one of the dealerships. He sights a growing demand for manure at the farmer level. On the other hand, dealer #2 has worked a little harder to sell the concept. To date there

have been no problems with objectionable smells, however this is always a concern when handling manure near residences.

ECONOMICS

The market price for dry broiler poultry manure, delivered and spread (spreading commercial fertilizer is usually at least \$2.50/A) on the farm is \$12/ton. This price also includes soil testing, manure testing and recommendations. Most brokers are applying at least 4 tons/A at any one time. The prevailing philosophy is to meet a farmer's maintenance phosphorus and potassium needs for three growing seasons. Since phosphorous is the main environmental concern it is being used to determine maximum application rates. In some cases this may leave potassium a little on the weak side. Since paying for 4 tons @ \$12/ton in one year would be difficult for most farmers creative financing programs have been discussed by the brokers including, ammitorizing farmer payments over a three year period. This will help the farmer avoid the financial and tax related problems of this large expense.

The following calculations have been developed for some probable scenarios to provide an idea of the economic value of various manure sources. These values have been developed from an average dry beef manure and a specific dry pullet manure that was dried on a conveyer and has no bedding in it, this is the best of the best. You will notice a significant difference in the manure nutrient values below. This simply illustrates the point that all manures are not created equal.

Nutrient value of manure: Nitrogen = \$0.18/lb, Phosphorus as P2O5 = \$0.19/lb and Potassium as K2O = \$0.12/lb (based on current markets)

Dry Beef Manure	Not incorporated* (spread in Mar-Apr)	Incorporated (spread in Mar-Apr)
Available N	\$2.48/t	\$2.96/t
P2O5	\$3.45/t	\$3.45/t
K2O	\$3.09/t	\$3.09/t
Total	\$9.02/t	\$9.50/t
Dry Pullet Manure	Not incorporated (spread in Mar-Apr)	Incorporated (spread in Mar-Apr)
Available N	\$8.06/t	\$9.86/t
P2O5	\$23.79/t	\$23.79/t
K2O	\$9.12/t	\$9.12/t
Total	\$40.97/t	\$42.77/t

*Applications done in the spring and incorporated immediately into the soil tend to conserve NH4 nitrogen (which accounts for at least half the N in poultry manure) and add significantly to the value of the manure. Conversely, applications made in

the summer (July & August) and are not incorporated may lose upwards of 60% of the nitrogen following application. For farmers applying manure following wheat in the summer it may be necessary to consider only phosphorous and potassium as the two nutrient of significant value.

Conclusion

In large part, farmer acceptance is a function of value. There may be a lot of nutrients sitting around the barn-lot but the market value could be poor if it is not spreadable. A large part of the real nutrient value of manure is determined after it leaves the animal. Adding bedding reduces the nutrient value and increases bulk. High moisture adds enough weight to hamper transportation. In order for a marketable manure to make it into the hands of the broker more attention will have be given to manure quality by the livestock producer.

As the benefits of better management and utilization of this fertilizer source are discussed throughout the farm and non-farm community, interest will surely increase. This is an idea who's time has come, it just takes some dollars to prime the pump and someone to act as a liaison between farm, business and research. We hope that in the next three years the two dealerships we are working with can find a way of making it on their own in the manure brokering business. We have yet a lot to learn and look forward to doing so.

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