MAXIMIZING THE VALUE OF MANURE: AN ON-FARM STUDY

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Discussion regarding the economic value of manure as a crop nutrient source has increased greatly in the past few years as commercial fertilizer prices have escalated. Establishing an accurate value for manure is an issue in livestock enterprise cash flow projections, sale/transfer situations, and in increasing crop and livestock profitability through maximization of manure value. The value of manure is determined by its capacity to replace the nutrients needed for crop production that would otherwise be purchased with commercial fertilizer. A consensus methodology for determining an economic value for manure appears to still be emerging. The authors of this study have developed the following formula: *Economic Impact of Manure = Value of Year 1 Fertilizer & Application Costs Replaced (+) Residual Value Nutrients Replaced (Mostly Year 2, if any) (+/-) Yield Response Beyond That Attributable to the NPK Applications (-) Manure Application Costs.* This calculation is calculated on a per acre basis. Then, *Total Economic Impact for Facility = (Economic Impact Per Acre) x (Acres Applied (Total Gallons for Facility / Application Rate Per Acre)).* Further comparative analysis can occur with *Total Economic Impact for Facility / Pigs Produced or Pig Spaces or 1000 gal. units.* A spreadsheet (Manurwkst.xls) has been developed to facilitate these calculations. It can be used for individual situations and also to develop a further understanding of the factors that influence value. High crop nutrient need, high manure nutrient concentration, high nutrient availability, avoidance of over-application, high fertilizer nutrient prices, and low application costs are among the important influences in maximizing manure economic value. Each of these factors is influenced by numerous sub-factors. In the fall of 2005 the economic impact of application of liquid swine manure from seventeen facilities in Minnesota was analyzed. Eight of these situations resulted in a value creation above the cost of application. Resulting economic impact was compared to a theoretical "best case" management scenario. Significant improvements were deemed possible in nine cases, averaging $0.33 per pig produced annually. The largest potential increase was $0.90 per pig produced. The most commonly occurring impediment to maximizing value was the application of manure to fields that did not require phosphorous (11 of 17 farms or 65%) because of high soil test P levels. Low nutrient concentration in manure limited value creation in 8 cases (47%). In these cases, higher application costs were incurred to achieve target nutrient application rates. Significant over or under-application of nitrogen occurred in 8 cases due to manure test levels varying from expected levels which were based on past years test results. In 3 cases crop selection (non nitrogen requiring crops), and in 2 cases surface application (resulting in low availability of nitrogen) were other factors that limited value creation with manure. Another observation was that manure test levels of P_2O_5 were significantly lower than reported book values. Grow-Finish barns averaged 42 lbs N-19 lbs P_2O_5-29 lbs K_2O per 1000 gallons as opposed to MWPS-18 Wet/Dry Feeder estimates of 58-39-29. Five of the facilities tested at 10 lbs P_2O_5 per 1000 gallons or less. Low dry matter content was associated with these low nutrient manures. The authors expected that a greater net manure value creation would have been observed in these facilities that are operated with good management. More facilities will be analyzed in 2006. The preliminary take-home message is that many producers can achieve greater economic value from manure by greater consideration of the key factors that foster the efficient use of manure nutrients for crop production.