Nutrient Management on Massachusetts Crop/Livestock Farms

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During 1992 and 1993 one third of all dairy farms plus a few other crop/livestock farms in Massachusetts were surveyed as part of a nutrient management and conservation tillage program conducted by Cooperative Extension. This involved farmers from all regions in Massachusetts for information relating to crop production practices. For dairy the farms visited ranged from less than 25 milking cows to more than 400 (Figure 1). Nearly half the farms visited had cow numbers, including dry cows, in the range of 50 to 100 cows; 70% had fewer than 100 cows. More than three quarters of the farms had fewer than 100 cows in milk at the time of the visit.

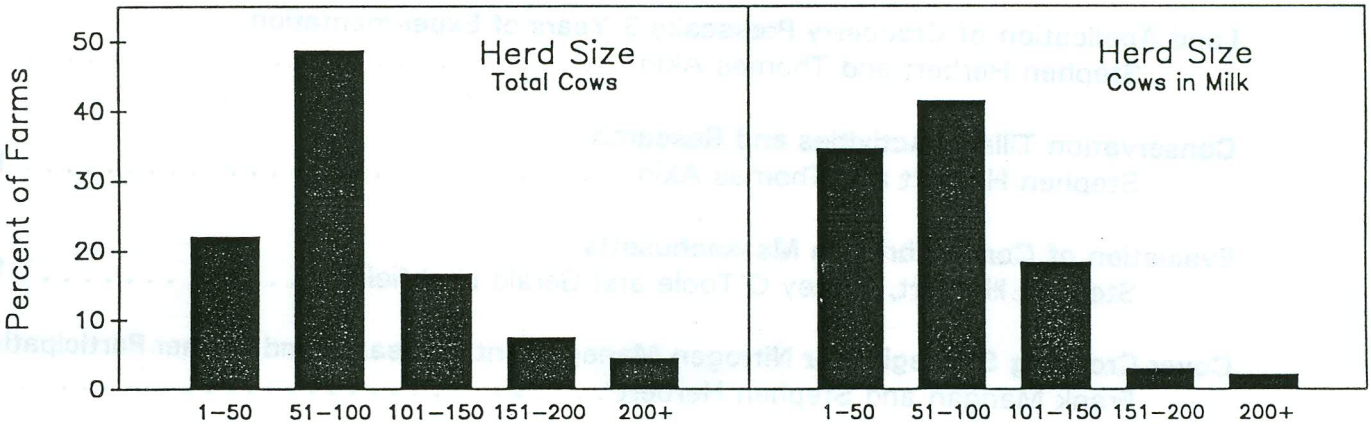

Figure 1. Total and milking cow numbers of 132 dairy farms visited as part of this survey.

Ninety two percent of all farms soil test, most (59%) soil test each year (Figure 2). Fewer farmers (20%) however, analyze manure for its nutrient supplying capacity (Figure 2). More than 80% of farms have not calibrated their manure spreader (Figure 2), and of those who have analyzed manure some still have not calibrated their manure spreader. Long-term overapplication of manure can result in crop nutritional problems as well as environmental concerns. Overapplication of manure on some fields may result in shortage of nutrients on other fields leading to expenditures for fertilizers that may not be necessary. Also assuming a certain level of nutrient contribution from manure but not attaining it can reduce crop yields again impacting profitability.

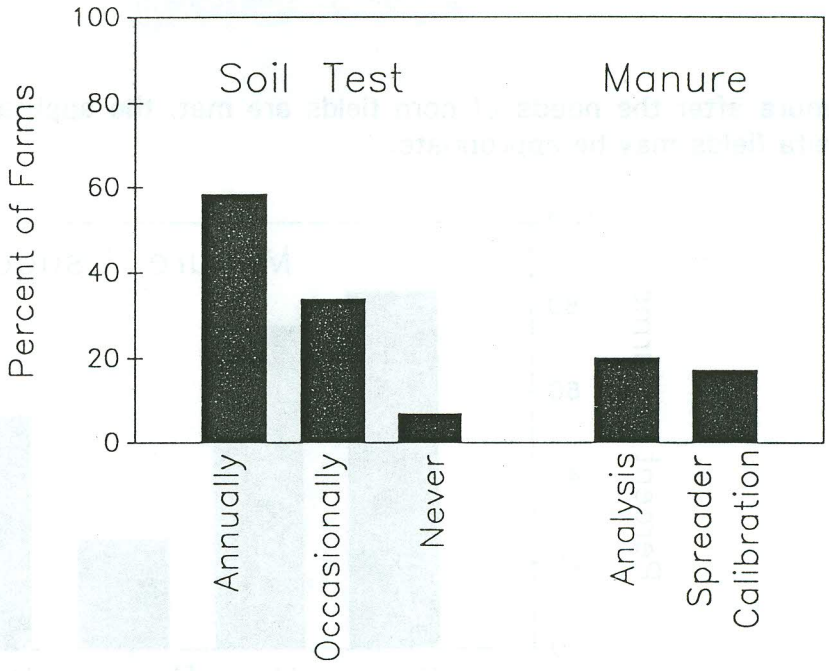

Figure 2. Percentage of farms soil testing, analyzing manure for nutrients and calibrating manure spreaders.

Approximately 10% of farms have liquid stage facilities, 25% have semi-solid storage with the remaining farms field stacking and/or daily spreading (Figure 3). These results suggest many farms are not achieving the optimal benefits from manure nutrients especially nitrogen. When manure is not incorporated all ammonium nitrogen can be lost within 7 to 10 days. This represents about 50% of the total nitrogen value of manure, and considering the remaining stable nitrogen is made available slowly over time during the next 10 to 20 years, most of the nitrogen benefit from this years application of manure will be unavailable or lost for plant growth. Many farmers indicated they did not incorporate manure in a timely fashion.

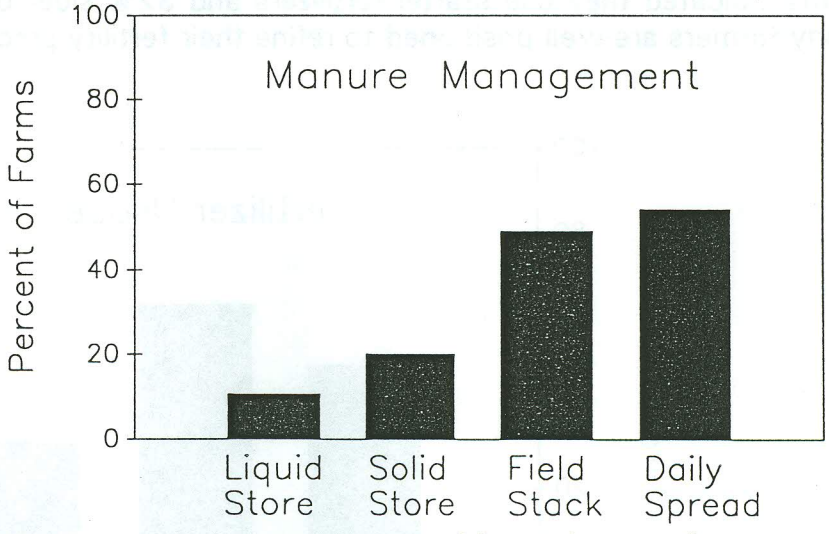

Figure 3. Management of manure on Massachusetts farms.

Almost 85% of farms utilize manure on corn fields, 76% on hay fields and more than 25% on pasture (Figure 4). Over 50% of farms have some corn fields where they don't spread manure. Corn fields should be the priority fields for spreading manure since nitrogen losses from surface applications to hay and pasture fields will be great, and other nutrients will be less available from surface applications. However, if there is surplus

manure after the needs of corn fields are met, the application to hay fields including alfalfa fields may be appropriate.

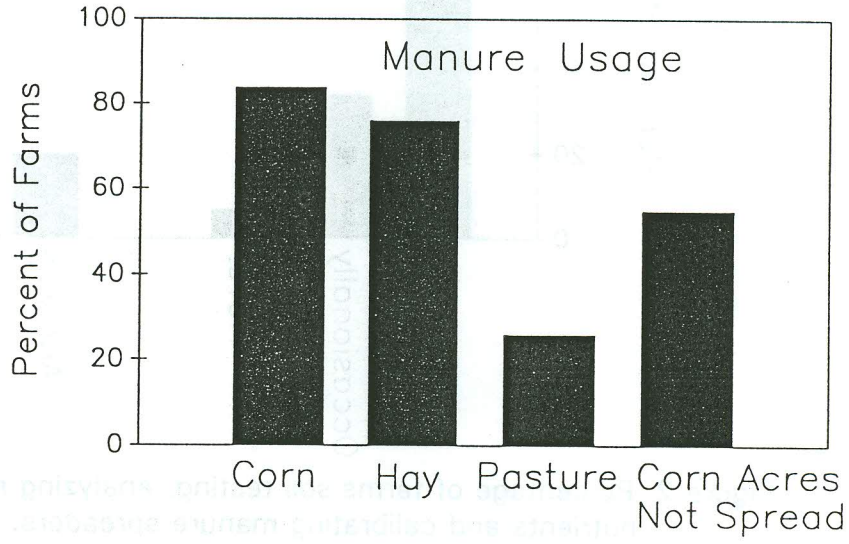

Figure 4. Manure usage on cropped land on crop/livestock farms.

Almost 50% of farms indicate they broadcast fertilizer on corn fields (Figure 5). Without working through a farm nutrient planning process some of this broadcast may not be needed. To avoid expenditures on broadcast N fertilizer that isn't needed we suggest only use starter fertilizer if the soil test indicates a need for phosphorus or else skip even the starter except in extremely early plantings. Then, for nitrogen needs, side- or top-dress based on the pre-sidedress N test when corn is about 12" tall. Sixty fourpercent of the farms indicated they use starter fertilizers and 32% side- or top-dress. This suggests many farmers are well positioned to refine their fertility practices with a little planning.

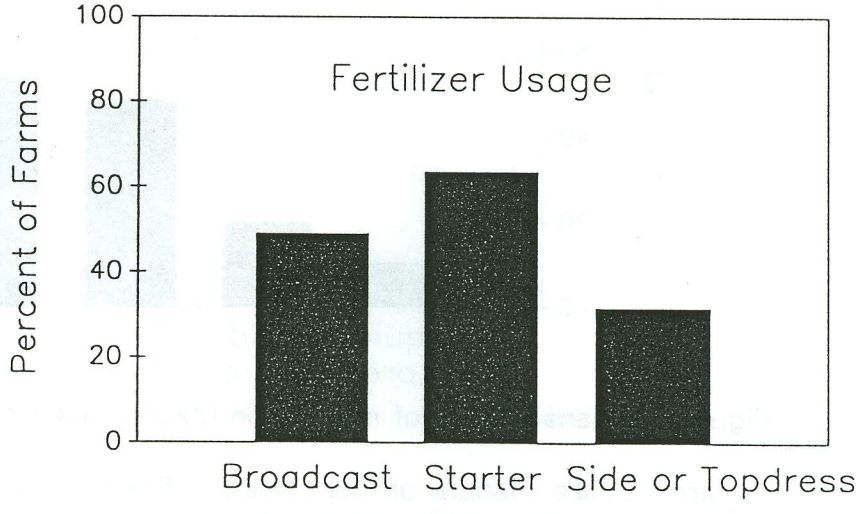

Figure 5. Commercial fertilizer usage on cropped land on crop/livestock farms.