

RESEARCH & DEVELOPMENT TOPIC: FEED MANAGEMENT	DELIVERABLES	TIMEFRAME	PROGRESS TO DATE
<p>Environmental availability of P in manure as affected by feed ingredients and feeding practices</p> <p><b>STEP 1: Due Diligence</b> Evaluate the extent to which the commercial and on-farm feeding systems in Manitoba have been optimized to minimize surplus P in manure. Include assessment to minimize wastage, increase P use efficiency and minimize P excretion considering the following tools:</p> <ul style="list-style-type: none"> <li>a. Real time feed ingredient/finished feed analysis;</li> <li>b. Phase/precision feeding for all major livestock species (confined and loose)</li> <li>c. Wet feeding</li> <li>d. Feed processing (e.g. steeping, rolling, pelleting, etc.)</li> <li>e. HAP feeds</li> <li>f. Phytase</li> <li>g. Individual feeding for confined livestock</li> <li>h. Bulk feeding systems for loose livestock e.g. bale grazing</li> </ul> <p><b>STEP 2:</b> Based on the above evaluation, determine specific research gaps that will be addressed through new feed management research and development projects</p> <p>Identify and implement feed rations and feeding practices that increase P utilization and minimize feed wastage and P excretion</p> <ul style="list-style-type: none"> <li>a. Commercially prepared and on-farm prepared rations be formulated to meet dietary P requirements using the available tools (usable P, widespread use and adoption of real time feed analysis for precision), optimize the usable portion of P (HAP feeds, phytase, etc.), and minimize excretion (includes processing practices)</li> <li>b. Identify and implement feeding practices that increase utilization and minimize feed wastage and P excretion (e.g. phase/precision feeding for all species (including beef cattle) and processing to optimize P availability/use efficiency; individual feeders, other feeding mechanics to minimize wastage, opportunities to reduce STP build up under mass feeding practices such as bale grazing)</li> </ul> <p>Conduct a comprehensive evaluation of any new and alternative feedstuffs for their impact on P excretion/environmental availability of P. Total ration formulation be adjusted accordingly - rate of dietary inclusion not to compromise P excretion (whole system cost - e.g. DDGS lower cost of feeding DDGs vs potentially higher cost of additional manure handling due to elevated P). Promoted adoption (awareness/incentives to grow and purchase) of feedstuffs that increase the proportion of available P relative to total P (e.g. HAP barley). Whole system analysis - e.g. impact on full nutrition and nutrient composition (i.e. protein, Ca, K, etc.), productivity, manure volume, feed and water intake, etc.</p>	<p>Feeding to livestock requirements for P with minimal excretion of P</p> <p>A report outlining what is known regarding the nutritional requirements of pigs, dairy, beef and poultry and how the commercially available feed matches these requirements. Understand the degree that manipulations to feed components can impact the P balance.</p> <p>feeding to livestock requirements for P with minimal excretion of P</p> <p>feeding to livestock requirements for P with minimal excretion of P</p>	<p>Review complete: June 2010</p> <p>Project complete: December 2012</p>	



RESEARCH & DEVELOPMENT TOPIC: MANURE TREATMENT	DELIVERABLES	TIMEFRAME	PROGRESS TO DATE
<p>Evaluate the opportunity for manure treatment to achieve manure P balance. Establish a provincial manure treatment technology evaluation program, accompanied by a defined and standardized set of evaluation criteria (both technical and economic performance and opportunities for value added byproducts as additional income stream) to be carried out by an unbiased 3rd party. This would include having a potential technology meet a certain criteria level prior to qualifying for import and for on site testing, evaluation and adaptation:</p> <p>a. Comprehensive literature review of techs, including use in other jurisdictions/contexts, to concentrate and recover P (s/l separation, etc.): reduce cost, improve efficiency, optimal separation levels, when/where to separate, etc. (to identify gaps to direct research);</p> <p>b. Development of a defined and standardized set of criteria for treatment technology evaluation;</p> <p>c. Identification of key manure treatment/processing investigations that should proceed concurrent with Integrated Assessment evaluation;</p> <p>d. Pending outcomes of integrated assessment.... Implementation of manure treatment technology evaluation program for existing technologies. In evaluating manure treatment technologies, along with the economic evaluation, there should be a social evaluation e.g. opportunity for establishing cooperatives - for manure treat for multiple species/multiple farms - specialized manure P formulations - for regions with specific P balance challenges;</p> <p>e. new income streams - research and evaluate potential markets for value added products and by-products of treated or processed manure (e.g. separated solids, compost, struvite, RO liquid "manure")</p> <p>f. Innovation - Continued investigation of new, adaptive and alternative manure treatment/processing technologies/processes (longer term - next generation manure treatment), including evaluation of potential markets for value added co-products</p> <p>Concurrently improve economics of conventional manure handling and enhance appeal for use as fertilizer (for both solid and liquid manure) - uniformity and consistency - explore manure processing options that concentrate nutrients and make a consistent product: (this was originally in the crop/land management section)</p> <p>i. concentrate nutrients and/or improve N:P ratios (e.g. decrease water usage, minimize volatilization and denitrification losses of N, feed management to decrease volume of manure generated (e.g. feeding fillers, overfeeding), etc.), <u>composting of solid manure, passive separation of liquid manure?</u></p> <p>ii. consistent/uniform manure nutrient profile (during pump out and application and consistent between multiple pump outs, or have a way to adjust application rates accordingly e.g. real time analysis; for solid manure, would require uniform mixing before field application, <u>passive manure separation level</u>)</p> <p>iii. In-field management - investigate and develop improved technologies for the transportation, application and handling of solid manure and <u>passively separated solids</u></p>	<p>A mechanism for matching sites with an economically viable manure treatment option.</p> <p>Identified viable manure treatment options and the costs associated with their selection.</p>	<p>Review complete: June 2010</p> <p>Project complete: December 2012</p> <p>December 2011</p>	<p>Literature Reviews in progress: Completion date set for June 30, 2010</p>

RESEARCH & DEVELOPMENT TOPIC: INTEGRATED ASSESSMENT - WHOLE SYSTEMS EVALUATION (Feed, Crop/Land, Manure Treatment)	DELIVERABLES	TIMEFRAME	PROGRESS TO DATE
<p>It was recognized during development and refinement of these priorities that an integrated assessment is necessary to fully identify what options are available for producers in certain production systems</p> <p>There will be different tools and various combinations of use that will be valuable to producers based on their situation (see schematic below). In some situations, none of the tools are economically feasible - consider the 4th tool box (socio-economic) - policy implications - individual or policy decision and maybe a 5th tool box which is alternative housing or management strategies (for all major livestock species)</p> <p><b>Step 1: INTEGRATED ASSESSMENT OF OPTIONS Due Diligence</b>  After exploring all other options determine if industry adjustment is the best path to pursue for both the Livestock industry and province - Economic and social cost/benefit analysis, long term sustainability (e.g., accounting for shifts in market demand) and possible limitations (e.g., lack of good water source in certain regions).  E.g., options -  A. P balance in SE MB by manure treatment with provincial support or  B. P balance in SE MB by permanent redistribution or thinning out of certain livestock operations with provincial support to complement the current federal program.</p>	<p>A transparent decision-making tool to determine viability of sites throughout the province based on degree of tool box use</p>	<p>Start: September 2010  Project complete: December 2012</p> <p>Complete by December 2011</p>	