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A New Approach to Hog Manure Management

ATD, the University of British Columbia Chemical Engineering Department, and Hipp Engineering Ltd. have developed a proprietary system for the environmentally responsible management of hog manure. This system can be installed in a variety of configurations to meet local needs. In its full treatment configuration, this closed loop system does not discharge to the environment and it eliminates lagoons and the requirements for a land base while reducing water consumption by over 50% and greenhouse gases by over 65% to produce a dry pelleted fertilizer that retains the nitrogen lost in liquid manures. The system will reduce odours substantially in all its configurations by treating the waste before it goes anaerobic. Where land is available, the pellets allow more flexibility and accuracy in field applications as well as opening the door for exporting any nutrient surplus.

Water consumption will be reduced to the extent that sterile, drinkable water is recycled to the barns. If water is in short supply or a rising cost, this conservation will be significant. Otherwise, irrigation options are available which will reduce the costs of water treatment.

If no other biomass fuel is available, we burn our own fuel pellet for drying energy. Assuming baseline greenhouse gas emissions are calculated on the typical lagoon/land disposal model using IPCC defaults and American Society of Agricultural Engineers animal data, the ATD system reduces emissions by about 65%.

Pathogens and weed seeds in the solids are rendered harmless by heat treatment during drying while pathogens in the liquids are also rendered harmless by ultra-violet exposure.

Economic viability is dependent as always, on market conditions, manure analysis and economies of scale. Larger operations will do better than smaller ones. Expansions on a current land base will therefore be attractive. At present, using chemical fertilizer equivalent prices, C\$15/tonne of CO₂ equivalent (tCO₂e), an interest rate of 5.5%, current storage requirements of Manitoba (400 days), and burning our own fuel, ATD can improve on current management costs for a converted 10,000 place grow to finish operation by an estimated \$100,000 per year. Key trends indicate improved payback in the future. Greenhouse gas reduction credits in Europe are forecast to increase as various trading systems come into play over the next few years. Nitrogen is linked to natural gas prices causing increases in fertilizer values. Manure management costs are

increasing — compliance, water, power, phosphorus loading, litigation, lost business opportunity.

Dr. Bruce T. Bowman's article, "Making Manure Processing a 'Standard Practice'", updated Feb. 19 2004, gives interesting insight, and is found on the ManureNet website (<http://res2.agr.ca/initiatives/manurenet>).

This is a computer-assisted system with remote monitoring to provide backup and support to farm staff. Being independent of the weather and access to the electrical grid, it can be installed almost anywhere. It is simple to run, all equipment is off-the-shelf, and it will not require specialized staff.

ATD has developed a computer model based on the Mass Balance for an 20,000-place and 10,000-place feeder operation and would be pleased to prepare estimates based on local conditions for interested parties.

ATD is actively searching in Canada for a host for a full-scale demonstration to kick-start commercialisation.

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