
PAMI BUILDS TANKER TRUCK INJECTOR FOR RESEARCH AND DEMONSTRATION

By Gord Hultgreen, PAMI

Introduction

With a large land mass and low rural population, Saskatchewan has the potential to greatly expand pork production. The objective of the project was to develop a liquid manure application system to efficiently apply swine manure to research and demonstration sites throughout Saskatchewan.

Project Description

After studying a number of alternatives, PAMI decided that the best option for applying swine manure to research and demonstration plots was to develop a truck-based system with vacuum/pressure tank. The truck would have the capability of traveling long distances, be able to pump swine manure directly from the earthen manure storage to the truck and be able to apply swine manure using either low or high disturbance injection.

Manure Truck Design Parameters

The truck is a 1994 Mack semi-trailer truck with the fifth wheel removed and frame stretched to handle a large manure tank. A low speed auxiliary transmission was added to allow field ground speeds as low as 1 mph. Wide tires were added to the front axle to improve in field flotation. A computer controlled tire pressure system is used to lower tire pressure in the field and on secondary roads to reduce field compaction and road damage.

Mounted on the truck is a 2700 imperial gallon pressure/vacuum tank that uses a hydraulic powered vane pump for pressure or vacuum. Down force on the tool bar can be adjusted for constant injection depth.

A three-rank, 10-foot wide toolbar is attached to the back of the truck with a parallel link system. The toolbar can be

equipped with high disturbance shanks and shovels or with low disturbance disc systems for operation in conventional or zero till conditions as well as in pasture. Row space can be changed to accommodate project requirements.

A GreenTrac distribution manifold is used for even manure distribution over a wide range of manure application rates.



PAMI's tanker truck injector system is based on a Mack tractor unit with a stretched frame.

A gas powered high-pressure washer and 100 Imperial gallon tank is attached to the truck for cleaning and disinfecting.

A Dicky-John Land Manager GIS/GPS system controls the manure application rate.

Ground speed is monitored by radar and a differential GPS receiver supplies field location.

Results and Conclusions

The truck injector system was completed in the fall of 2000 and all manure application research plots were applied using the new machine. Both high disturbance and low disturbance plots were applied successfully with the new system. A few modifications to the toolbar have been made to improve field performance.

Implications

The injector truck is now in service and is used for all swine manure plot research conducted by PAMI in Saskatchewan. Discussions are in the planning stage with Sask Pork for expanding the use of the machine by conducting swine manure application demonstrations in addition to the research activities.

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