

ENVIRONMENT

Title: Distribution of Discharge from Liquid Manure Applicator Manifolds.
NPB # 16-067

Investigator: Kapil Arora, Agricultural Engineering Field Specialist

Co- Investigator: Daniel Andersen, Assistant Professor

Institution: Iowa State University, Ames, IA

Date Submitted: December 1, 2017

Scientific Abstract: Uniformity of liquid manure application across the tool-bar points is important to ensure proper nutrient supply for crop growth, to maintain producer confidence in nutrient availability, and for addressing water quality concerns. To date, no research has been performed at field-scale to determine the variability of liquid distribution across the tool-bar points, transverse to the direction of travel. In this project, seven commercially available, tank-mounted manifolds and three dragline mounted manifolds used for liquid manure application were tested for coefficient of variation. Testing was performed using water and coefficients of variation were determined for application rates ranging from 2,000 gallons per acre to 6,000 gallons per acre by setting the manifolds under field conditions and using manufacturer specifications for operation. The tests were performed under three different slope conditions of 0, 3, and 6 percent to simulate cross-slope manure application. Coefficient of variation, as measured across the tool-bar, was less than 20 percent for five of the ten manifolds tested for the five application rates for all three-slope settings. Two manifolds tested had coefficient of variation less than 10 percent for all of the test settings. On the opposite end, coefficient of variation for one of the manifolds exceeded 100 percent. Results of the testing indicate that caution should be exercised to select the appropriate manifold when applying manure such that the lowest possible coefficient of variation is achieved.

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

For more information contact:

National Pork Board • PO Box 9114 • Des Moines, IA 50306 USA • 800-456-7675 • Fax: 515-223-2646 • pork.org
