Paul C. And Edna H. Warner Endowment Fund for Sustainable Agriculture
Report Form

Summary: (describe your project, it's objectives and results in one or two sentences)

This project involved completing nine on-farm, field size, replicated corn research & demonstration plots in western Ohio in the 2013 growing season. The livestock producers involved with this project were in Darke, Mercer, Paulding and Putnam Counties. The watersheds were the Grand Lake St Marys, Lake Erie and the Ohio River.

Liquid swine manure was applied to corn fields in early June when the crop was in the two to three leaf stage. Manure application rates, in gallons applied per acre, were based on manure tests collected in advance of application. Application rates of manure nitrogen, in pounds per acre, were applied to the corn were similar to each farmer's normal nitrogen sidedress application rate. Commercial 28%UAN fertilizer was applied to the plots on the same day the manure was applied.

Plots were harvested in October and yield results recorded using a weigh wagon or a combine monitor. Liquid swine manure was shown to supply a growing corn with adequate nitrogen, phosphorus, and potash comparable to commercial fertilizer while producing crop yields comparable to commercial fertilizer.

What was done? (one paragraph describing the goals, experiments and how they were performed)

Liquid swine finishing manure was applied to post-emergent to corn to meet the agronomic needs of a 2-year corn/soybean crop rotation. Application equipment consisted of a 6,200 gallon Jamesway manure tanker with a Dietrich toolbar. The manure tanker was rented from a Paulding County livestock farmer and a tractor was provided by Lefeld Equipment located in Coldwater, Ohio. The manure tanker was modified to travel down corn rows. All manure was injected at a depth of five inches when applied to minimize odor and maximize nutrient retention. The Dietrich toolbar used was equipped with covering wheels to assure the injected manure was completely covered by soil.

Most reps were 1,000 feet long and 30 (12 corn rows) to 40 (16 corn rows) feet wide. Manure treatments were compared to commercial fertilizer treatments in a randomized block design pattern. Every demonstration/research plot was replicated four times. Manure was applied by Glen Arnold, Field Specialists, Livestock Nutrient Management Systems, Ohio State University Extension. Most of the plots had good rainfall and produced strong corn yields.

What were the results? (one paragraph on the outcome of the experiments, what was learned from them)

In October, all manure and commercial fertilizer replications were harvested. All yields were adjusted for moisture and are reported in the chart below. Samples from the commercial fertilizer treatments and the manure treatments were also tested for DON. Deoxynivalenol (DON or

vomitoxin) is a mycotoxin produced by certain species of *Fusarium.* The mycotoxin deoxynivalenol causes reduced weight gain and suppresses animal feeding, especially in swine. Test results for both the commercial fertilizer reps and the manure reps were found to be below detectable levels. There were no detectible differences in test weights between the manure reps and the commercial fertilizer reps.

Manure Sidedress Plot Results (bushels of corn per acre)

Farmer	28% UAN	Swine manure
R. Alig (Mercer County)	200.3	214.5
T. Schmitmeyer (Darke County)	200.5	202.2
S. Schmitmeyer (Darke County)	168.1	178.1
M. Albers (Mercer County)	177.3	177.7
D. Link (Mercer County)	152.2	151.5
T. Harrod (Darke County)	210.1	181.9
K. Schmitmeyer (Darke County)	235.3	233.7
J. Klopfenstein (Paulding County)	198.7	197.9
J. Duling (Putnam County)	189.3	193.9

How have the results contributed or will they contribute sustainable agriculture? (One paragraph on how will farmers use this research information and what difference will it make on their farms.)

The spring/early summer manure application to growing corn crops was proven to be successful. Farmers involved with this project are looking at ways to make this improved method of manure utilization work on their farms in future years. Two of the participating farmers are planning to apply manure to their 2014 corn crop using a commercial drag hose system.

A summary meeting was held on December 20th for participating farmers. The yield results for the plots were discussed. All farmers received a copy of their manure analysis and copies of all the plot results. Plot results are in the process of being peer-reviewed and will eventually be posted on-line at the Ohio State University Extension Agronomics Crops Team website at http://agcrops.osu.edu/.

Information and findings of the project will be shared at numerous 2014 Ohio State University Extension programs and producer events including the Ohio Conservation Tillage and Technology Conference, Ohio Pork Congress Symposium, the Crop Observation and Reporting Network newsletter, and the Ohio Manure Science Review.

Livestock producers will be more willing to consider applying manure to growing crops in future years based on the results of this research project.