

# **“Coupling Manure Application and Cover Crops: Can it Work and What are the Benefits?”**

**January 15, 2010**

The webcast is archived at:

[http://www.extension.org/pages/Manure\\_Nutrients,\\_Cover\\_Crops,\\_and\\_Slurry\\_Seeding](http://www.extension.org/pages/Manure_Nutrients,_Cover_Crops,_and_Slurry_Seeding)

***8 inches sounds very deep for manure placement. Was that depth selected for a reason?***

Tim Harrigan: The aeration tines are 8 inches and I generally run them that deep if possible to alleviate shallow compaction and improve infiltration. There is usually backfill in the tine slots if the soil is at the correct moisture for tillage. We have estimated initial manure infiltration by measuring P concentration in the tine fracture and we usually see 90% of the manure in the surface 4 inches.

***What was the actual seeding rate for the rye and oats?***

Tim Harrigan: We used 2 bushels/acre for both drilled and slurry seeded crops.

***Is anyone looking at the runoff implications of simply broadcasting manure over growing rye?***

Tim Harrigan: I think it would be similar to broadcasting over other vegetative covers.

***Have you done or do you plan to do any economic analysis of the results?***

Tim Harrigan: I calculated that slurry seeding reduces fuel use about 2 gallons/acre and labor about 0.35 hours/acre compared to more conventional cover crop seeding methods like drilling after a light tillage operation. There is room for a more formal analysis.

***Is there an efficient tool to load the seed into the top of the spreader without climbing on top of the tank?***

Tim Harrigan: It is not too hard to put a step ladder up against the tank and dump in the seed when it is filling. I have not tried to mechanize the process.

***Is there a potential for compaction problems using this kind of equipment?***

Tim Harrigan: There is always potential for compaction with large equipment such as slurry tanks. I like this implement because it provides low-disturbance loosening in the seedbed behind the tractor and tanker tires. The surface infiltrates well if that is your last pass across the field.

***What variety of cereal rye was used?***

Jeremy Singer: We used Maton and Wheeler rye.

***Tim, have you tried to convert your loss measurements into relative NH<sub>3</sub> availability that you might predict from the three methods?***

Tim Harrigan: We estimate that losses could be as much as 30-40 pounds of N/acre in the first 24 hours with broadcast operations based on what we saw, aeration losses were generally much less than that. Incorporation losses would vary considerably based on the delay between application and incorporation and the type of tillage tool used.

***Is there any data on chicken versus swine manure?***

Tim Harrigan: I have not worked with poultry manure, we have been working with a slurry process.

***Are there any good studies out there on blends of cover crops versus a single species?***

Tim Harrigan: Check the Midwest Cover Crops Council website (<http://www.mccc.msu.edu/>).

***Thinking of the carbon footprint issue, would it be worthwhile to look at N<sub>2</sub>O emissions?***

Tim Harrigan: Yes, manure land application is full of environmental and other trade-offs. I am always interested in the quantification of those issues.

***Has your data been exposed to growers?***

Tim Harrigan: We have published journal and extension publications, many presentations at field days and grower meetings in the Great Lakes Region. We (Michigan and Indiana) received a CIG grant in 2009 to develop the process on farms in the region.

***Could you share some of your N<sub>2</sub>O emissions take home messages?***

Jeremy Singer: We published a paper in Agriculture, Ecosystems, and Environment in 2009 (Jarecki et al., 2009, 134:29-35) that combined results from a laboratory experiment and a field experiment. In the laboratory, we found that a cereal rye cover crop lowered N<sub>2</sub>O emissions compared to a no rye cover crop treatment both with a nitrogen-based manure application rate. The field results found no significant reduction in cumulative N<sub>2</sub>O emissions with or without a cereal rye cover crop and no manure application or with or without a rye cover crop at the same target manure nitrogen rate. We concluded that a cereal rye cover crop has the potential to reduce N<sub>2</sub>O emissions, but the nitrogen application rate may be the overriding factor.