WORKING WITH CUSTOM MANURE APPLICATORS

Kevin Erb [1/]

One out of every three gallons of manure produced in Wisconsin is applied by a custom manure applicator. As of December 2006, there are just under 100 for-hire manure applicators in the state—the smallest handle less than 500,000 gallons each year, the largest over 400 million gallons annually.

A recent informal survey of Wisconsin's applicators showed that less than 3% of farmers are showing the applicator a copy of their nutrient management plan. A slightly greater percentage relies on the custom applicator to suggest a manure rate for a particular field. The vast majority of rate determinations are made by the farmer (who may or may not be relying on their crop consultant for advice).

Keeping in mind the following facts and suggestions will make the nutrient management implementation process easier for the farmer, the crop consultant and the custom applicator.

1. **A single sheet and a map**: Provide each of your clients with a single sheet that lists ONLY the fields to receive manure, acreage, manure rate, and if incorporation is included as part of the nutrient management plan. A map showing the entire farm with those fields highlighted makes the applicator's job easier. The CCA should also put their phone number on the field listing so that if the applicator needs clarification, he can do it quickly and effectively.

2. **The rule of 2's**: Do not plan a different rate for each field. If you can group field by rate (high fields at 15,000 gal/acre, low rate fields at 9,000 gal/acre), mistakes are less likely to happen. Larger farms may have 3 rates.

3. **How low can you go?** Call the farmer's manure applicator in the dead of winter. Find out not only what rates they prefer to use, but also what is the lowest they normally go and how low they actually can apply. It does no good to recommend 4,000 gallons/acre if his equipment can't go below 8,000. Lower rates increase wear and tear and take longer, so they will drive the cost up for the farmer.

4. **Go north in odd-numbered years.** Well, not really. But if you can group fields by location (north this year, west next year), it may reduce costs by eliminating the down time of tearing down and setting up equipment.

5. **Remember the road:** Those low phosphorus fields are prime targets for manure. But if the tanker can't get there easily (low weight limit bridge, field access through neighbor's yard), hold that field until a year when a dragline is available.

6. **A manure sample in the bottle is worth two on the dashboard**. Find out from your client when the applicator is pumping. Make sure a sample is taken, or better yet, do it yourself. A sample taken from the dragline after it's being wound up at the end of the job is worse than no sample at all.

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7. **Madison, Green Bay and Manure Draglines.** Both downtown Madison and downtown Green Bay are laid out on angles. Manure draglines need to be laid out in a similar way. Weird shaped fields will not receive an even application of manure from an inexperienced dragline operator.

8. **Use the off season:** Manure applicators are available during the summer, and making an application before hay or winter wheat can buy your farmer much needed fall flexibility, esp. in wet falls.

9. **Encourage your client to hire a certified applicator.** A trained applicator is more likely to understand the regulations and helps insure that the 590 is implemented more effectively. More than half of Wisconsin's applicators are trained, tested and certified by their professional organization.

10. **Consider a partnership**. Many manure applicators are looking for qualified drivers in the fall season. Creating an employee sharing arrangement with a local manure applicator may help you keep some of your more valued pesticide applicators by providing off-season employment.

More information is available at the PNAAW website at www.wimanuremgt.org

The following is a related paper by Dana Cook

DELIVERY TO FIELD COST, STORAGE, CUSTOM VS. OWN, CONTRACT HOW'S AND COMPACTION

Dana Cook and Kevin Erb [1/]

Manure Application Cost Considerations: Delivery to field cost, storage, custom vs. own, contract how's and compaction

Making it easier (and less costly) to get manure to the field:

The delivery to field cost varies greatly with distance to the field, road conditions getting to the field (i.e. curvy, stop signs, single lane, poor condition, traveling through town, etc.) equipment used (tractors and tanks, trucks, hose). The best solution to this is to maintain your field roads and driveways. By comparison *it would take you about the same amount of time to travel three miles down a township road as it takes to traverse a 1,500-foot field lane that is rough and full of potholes*. Costs increase for distance traveled also, say you can haul 4 loads per hour three miles away, and only maybe 3 loads per hour at six miles, it will take that many more hours to get the job done.

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Manpower: Having a farm employee at the tractor to load saves the time of the driver having to get out and walk to the tractor, load the tank, and then walk back to the vehicle. Over a day this could save you over an hour or more depending on how many pieces of equipment are hauling with. One other very important factor in keeping cost low is to have a good quality pump with an 8" discharge minimum. The bigger the discharge the faster you can load, which equals more loads hauled in a day. Also a good pump is going to be expensive if you buy your own, so don't skimp on this, if you do skimp, it will cost you more than a good one in the long run, because it will take you longer to pump the pit out over the lifespan of the pump.

Also, if the hauler has not been to you yet or you need to haul after it freezes, DO NOT do any type of tillage in the fields. Spreading on rough ground will take longer, cost more and some haulers refuse to haul on frozen tilled ground. And another problem that arises in fall is that after it is tilled and it gets rained on it takes forever to dry up enough to haul on without dragging mud all over the place, then you have to wait until it freezes, which leads us back to the first problem, frozen tilled soil.

Storage

- Bedding choice: Sand or Mattress; this is a big deciding factor on your pit

    1. Sand-no under barn storage, no pumping into lagoon, gravity flow not recommended, direct push-off into the pit is the best. If you insist on using sand without a direct push off, DO NOT put the parlor water into the reception pit in the barn, or use sprinklers in the barn. This is guaranteed to plug the pipe to the lagoon. Sand is a cheap bedding source, but it is VERY expensive to remove from the pit. One other concern that you need to keep in mind, is what will the sand do to my soil with prolonged use? Hose draggers do not like to pump out sand laden manure. *Many applicators will add a surcharge for sand manure to cover extra wear and tear on equipment.*

    2. Mattresses—You can use any style pit that you want to. Some types of wood shavings are too coarse to pump through hoses for the hose draggers. If you are going to have a hose dragger pump your pit, check with them for suggestions.

- Pit placement-under the barn or lagoon, depends on bedding choice, pros, cons, & needs.

    1. Under the barn—The main thing to keep in mind if you locate the pit under the barn is how are you going to get the solids out? You are going to NEED an access ramp. They are difficult to agitate because usually cannot see where the solids are filling up at. Plus the piers holding the floor up are a hindrance to agitating. You can use any bedding but sand. You don't get rainwater in the pit, which is a good thing. Because less rainwater equals more capacity for manure. Underbarn pits present a huge safety issue—if one must enter them to remove solids or check agitation, an air supply is a must.

    2. Lagoon—The main concern with this is to have enough room available to easily accommodate the equipment that you need to agitate the pit. Which relates to about 150 feet around the outer edge of the pit wall or lagoon bank. Round pits agitate the easiest. If this is impractical a long and narrow pit is easier to work with than a large square lagoon. Try not to get over 150 feet wide, at the top of the lagoon. Any bedding is acceptable. Stirring pads are required as a minimum to keep from ruining the liner. It is highly recommended though to have a

concrete ramp and the bottom in the pit. It is a MUST if you use sand! Make sure the ramp will be easy to negotiate when pulling a loaded spreader out of the pit.

3. General needs for all pits—An easy access road to the pit area. It should be wide enough to allow the equipment to easily pass if you only have one way in and out. Keep in mind that the equipment is between 9 to 16 feet wide with injectors on the tank. And large trucks can be upwards of sixty feet long. A large area to accommodate more than one piece of equipment in the loading area to get situated to back under the load pipe. It is nice to have a level loading area that is a good gravel base at a minimum. If you have the means, a loading area that is concrete with a drain running back into the pit is nice to keep the mess contained better. Also a flow through system (enter one driveway and exit another) for the equipment works the best. Especially if you can keep it away from the buildings and other daily activities on the farm. How is the pit location going to fall into the further expansions in the future? Will the needed accommodations for hauling manure out, still be met? Also if you plan on having a custom hauler do your hauling, contact them prior to building an see what type of equipment that they have and what kind of needs that will be required to get their equipment into the pit properly. Simple things such as this are time and money savers in the long run. Even if you want to haul your own manure and you are not sure of some of the planning or concerns for your pit, or even questions concerning equipment, contact a custom hauler or two and get some ideas and opinions. Because it is easier to change it before it is built or bought.

Custom vs. own

- Custom hauler or self hauling- pros & cons:

1. Custom hauler—Pros-most or all of the equipment is supplied by the hauler. No costs to the producer for equipment purchases and maintenance costs. The custom hauler can bring in several units to get the job done faster than the producer could haul on his own. We can get the job done in days compared to weeks. If the hauler certified by the Professional Nutrient Applicators Association of Wisconsin, they will know what the rules and the latest changes are. And they should spread accordingly, if supplied with the correct up to date nutrient management plan for the farm. This gives the producer more time to focus their abilities to other projects, without having to be constantly checking up on the hauling progress.

2. Custom hauler—Cons-not always available to haul the exact time that the producer is ready to go. Rain affects scheduling of jobs, for every day it rains; you can add 2 days in delays. Crops can also hold the season up and put the custom hauler way behind. You need to be patient, especially in the spring.

- Self hauling-Pros—set-up and go whenever you want to.

1. Self hauling-Cons—The equipment is very expensive to have sitting around for 11 months of the year. Time is money; you will be spending weeks doing what a custom hauler can do in days. Equipment costs- truck set up properly with floatation tires, $50,000-$80,000; tanker $10,000-$60,000, with injectors add up

to another $10,000, plus the cost of properly sized tractor to pull it; hose system- $80,000-$250,000 depending on the type, size and amount, reel size, and tool bar. Plus a properly sized tractor to pull it. A good pump $14,000-$26,000.

2. Other things to keep in mind—
Neighborhood spreading- i.e. the custom hauler spreads several farms next to one another rather than go to one county today, and a farm in another county tomorrow. It can take several hours to take down equipment and travel on lengthy moves compared to hauling your way through a neighborhood. But one thing that you absolutely must have is good planning amongst neighbors to be ready when the haulers come through. This includes having your tractors fueled, radiators blown out, and ready when they get there. The pit agitated ahead of time if you have your own pump, and a good plan of where the manure will be hauled and how much to apply. These simply things will save you time and money. Off season spreading (June, July, August) schedule your crop rotation to be able to haul during the summer month, by planting canning crops or wheat.

Contracts

- Contracting can be extremely difficult to say the least. A lot of the haulers will not even get involved with contracts. It creates too many problems with logistics when hauling season is in full swing. This is like planning a harvesting date before the crops are even planted. There are too many variables. We all realized that farming is not a scheduled event. The best approach to take is to get to know the custom haulers operation or operating habits and to have a good working relationship with them. Most haulers are well aware of the need to haul in a timely manner, and get stressed out as easily as a producer who is waiting for their arrival, when the weather and crops turn against them. Ask other producers about them if you are interested in their services. Always be cautious when someone you are not familiar with is trying to talk you into contracting with them. Ask for references that you can contact or call other haulers and ask about the person or company in question. There are cases of individuals being talked into something that they normally would not do and it has cost them. An example would be prepaying for hauling, then they haul one day and they give you an excuse that they need pull out, not to be seen again. It has happened.

  Also not contracting allows you to keep your options open. You have the right to select anyone that you feel comfortable with. There are several producers who will call several haulers, and the hauler who shows up first gets the job. If you take this approach make sure you call everyone back that you have called and tell them that their services will not be needed. Also keep in mind that using this approach, it is like the little boy that cried wolf, pretty soon you will not be priority to any one. This is not good practice to get into.

Compaction

- Great strides have been made in manure hauling equipment to address compaction issues. Tires are larger and wider to spread weight out over a larger area. Tire companies are addressing the issues of truck tire compaction and are coming up with some really good floatation tires that are small enough to fit on the trucks and carry the heavy loads and give superb floatation with substantially less compaction. Less compaction equals higher yield, which benefits your financially.

Nutrient management and maps

- You need to have a plan before you start pumping. This is where a lot of producers struggle. You have a lot of fertilizer potential going to waste or used in an uneconomical fashion. They fail to recognize the money that they could be saving in fertilizer costs, by simply applying manure correctly for future crop needs. This is where a good crop consultants or agronomist is worth his or her weight in gold. They can tell you how much manure to apply to meet crop demands. And have it specified by field and available for the hauler to have in their possession when hauling.

  It is critical to have field maps that are easily legible and accurately labeled, with the field id number, the application rate, set backs and non-spreading areas or any other specifics for the field being spread. Have enough maps available for all the haulers.

  Some farms are beginning to post field names at the ENTRANCE to the each field so sprayers, manure haulers, etc know exactly where they are. If this is not feasible for your operation you should, at a minimum , take the crew leader to the field or fields and explain exactly what you want applied and where. This will hopefully insure that there is no confusion.

NOTES

1. **Can you break even on manure—**Liquid dairy manure per thousand gallons, total nutrient value is 28-9-20, but first year available to nutrients are 10-5-16 (assuming that incorporation is within 72 hours of application). 7-5-16 if after 72 hours. Value is $16 per thousand gallons total, but we use first year availability, which is $8-$9 per thousand gallons. Hence if a tanker holds 4,000gallons, the value is $28-$32 per tanker load. Use $25 per tanker to make math easy. With 4 tankers hauling and you get 16 loads per hour hauled at a value of $400 per hour. Cook's charge $65 per hour, per tanker, for a cost of $260 per hour, for 4 tankers (farmer provides fuel). Manure value is almost double the hauling cost. The crop does not use all available nutrients, this year. For every 4,000 gallons of manure applied to the acre during corn years (assuming 125# of 9-23-30 starter), saves you money later in the crop rotation. That 4,000 gallons equals the potassium in 100# of 0-0-60 top dressed on alfalfa. Over the long term it all evens out. If we look at corn recommendations at the optimum soil test level, it calls for 160# N, 55# phosphates, and 35# potash.

   At current fertilizer values, crop removes $58 in N plus $27 in phosphate and potash, or $85/acre in fertilizer to produce 160 bushel corn.

2. **The most important point—**Manure slowly releases its nutrients throughout the growing season, compared to commercial fertilizers that are quick releasing. Which means if your commercial fertilizers are not applied at the proper time, they may have already gone through the soils, and are not being of any benefit to the crops. Where as, manure is continually breaking down and feeding the crops throughout the growing season.

3. **Parlor water—**Dilution factors vary from parlor water. Most producers have a high amount of water usage in washing down the parlor until they get a system worked out that is efficient, especially when it is new to them. Also keep in mind that different employees have different priorities that may contribute to excess water usage, which may require some extra training to work out. The most economical parlors recycle their water when they can, for flushing.

4. **Rain water—**A lot of producers fail to recognize the important of rain gutters and water diversion dikes. Here is an example why they are a money saver.

   For every square foot or roof or ground area, that drains water into the lagoon, you lose capacity for manure. (1 inch of rain per square foot gives you .62 gallons in the pit, or 17.5 gallons yearly per square foot, based on a normal yearly rainfall.) Therefore a free stall barn at 300 by 60 means that 315,289 gallons of rainwater will enter the lagoon, (roof areas is square foot of ground covered, not the square foot of the roof surface area). Based on a 4000 gallon tanker hauling 4 loads an hour, it will take approximately 19.7 hours to haul the water. At a cost of $65 per hour this will cost $1280.50, every year. What do you think about wasting money on gutters now? 315,289 gallons of water would be equal to using 430 gallons per milking (2x) for parlor wash down.

5. **Injection on conservation plans—**Number one, most plans are flexible. Most counties will work with the producer to modify it as manure application and crop rotation changes. Use manure injection as primary fall tillage.

   No-till—Options are more limited. Zone tillage or strip tillage works. Aer-way is also an option. Another option is to fall seed rye, wheat or barley before injection, or apply early and seed after incorporation.

6. **Pit sizing and designs—**I recommend using at a minimum 35 gallons per cow per day. That may sound like a lot to some of you, but this also takes into account the water used to wash down the parlor. See Parlor water above. Also by code you are supposed to have 2 feet of freeboard in your pit at all times. This is one point that I see violated all the time. Another thing that is always missed is that unless you have a sump in your pit and it is sloped properly to the sump, your over all pit capacity is reduced because depending on what type of pump you have, there will always be anywhere from 6 to 18 inches of manure left in your pit which will greatly reduce your overall capacity. Make sure that you add all these points to your planning for overall pit capacity. One last suggestion, although there are some good engineers out their designing pits, they are more accustom to concrete and rebar than they are to manure and manure handling equipment needs and use. So with that said I highly recommend having a custom hauler look over your plans and location to give you some good information on what will and will not work. It is easier to change the pit before it is installed, than trying to change it afterwards.

This outline was put together for you on behalf of the Professional Nutrient Applicators Association of Wisconsin. If you have any questions, comments, concerns, or would even like to become a member of the Association, please direct them to:

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