

The Smell of Money!

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Seriously, you are smelling money being spread on the ground when manure is being broadcast. Well, sorta. Manure has value to farms and contains things that crops need. The smell isn't necessarily all that pleasant all the time, but it is a vital part of livestock farming.

Manure Science

Why would anyone want to do anything with manure other than to get rid of it? Because it is a valuable resource! Manure contains many of the basic building blocks for crop growth, including nitrogen, phosphorus, potassium, some micronutrients, and organic matter. While all of these nutrients are very important, nitrogen and organic matter are really what farmers want the most out of their manure. Nitrogen is the nutrient that is most often in short supply in crop fields. Organic matter, which is essentially plant fiber that is broken down, helps the soil hold water and hold nutrients. That's important to farms especially during dry summers.

That money smell again

Manure has value. Farmers sell it, trade it, or buy it. It can be treated like another farm commodity. According to MSU Extension Educator, Jerry Lindquist, right now the fertilizer value of 1,000 gallons of liquid dairy manure is \$18-\$20, based on current commercial fertilizer costs. Lindquist also said that the value has fluctuated in the past several years from a low of \$14 to a high of \$50 per 1,000 gallons.

Spreading manure also provides jobs in our area. There are at least three or four custom haulers in this area that get paid by farms to haul and spread manure onto a farms fields. These custom operations can do this faster than most individual farms can by providing many tractors and spreaders as opposed to a farm just having a few or perhaps only one manure spreader.

Because of its fertilizer value, farmers will often trade or sell manure to a crop farmer that doesn't have access to manure. Morgan's Composting near Sears, Michigan has made a business from composting excess manure from livestock farms and then reselling the finished product to farms and homeowners.

Making it work

There are several steps involved in the use of manure: testing it for its nutrient composition, using a storage system combined with handling equipment that will get the job done efficiently, and ensuring that the environment is enhanced rather than degraded.

Testing manure? Does it pass? . . .

Farms will send in samples of manure to a lab to have it analyzed for the level of nutrients that are in it. Because solids will settle out in a manure pit, samples are taken at different levels. No, no one goes for a swim to get the samples. There are pumps that suck up the manure and transfer it to a spreader. Samples are collected at different times during pumping to get the most accurate results.

Manure handling equipment

Spreading manure from a typical dairy farm generally requires two different types of manure spreaders, a liquid manure spreader and a solid manure spreader. A liquid spreader can involve a

tanker truck, or an irrigation system. Solid manure spreaders come in a lot different shapes and sizes. The biggest thing is that it has to be able to break up the compacted manure and bedding. A popular type is a deep V bottom or side sling manure spreader. The spreader is shaped like a V with augers in the middle to break up the solids and then it is directed out the side of the spreader. In small livestock operations, a small box type spreader that pushes the manure towards the back of the spreader and the paddles on the back break up the solid manure.

Managing Sand = New Technology

Most dairy farms bed their animals with sand because the excellent drainage it offers helps prevent diseases such as mastitis. Manure pits on dairy farms are large, large enough to hold six or more months' worth of manure and sand bedding from all the cows on the farm. Many of the pits hold a million gallons or more of manure and sand. The sand settles out in the bottom of pit, and then has to be scooped out when the liquid is pumped out.

Farmers do try to agitate the manure in the pit with the pump but it still doesn't break up the solids well enough. So there's been new equipment created to address this. There's a technical term for the equipment but farmers just call it a boat. The boat is basically a floating air compressor that shoots air into the manure and get the solids back into the upper levels of the pit which makes the manure nutrients more homogenized throughout the pit.

Another way to handle sand is to not put it in the pit in the first place. Several local dairy farms are utilizing concrete structures next to the manure pits that are known as "sand lanes." The sand/manure mix from the barns is either pumped or dumped onto the lane. The lane is on a slope, and the sand that is in the manure settles on the lane, and the liquid continues into the manure pit. The farm then scrapes the sand out of the lane every few days, and piles and turns it so that it will dry. The dried sand is tested for pathogens, and if it is safe, it is reused for bedding on the farm. Brian Brunink, co-owner of Hidden Hills Dairy Farm near McBain, says that by using a sand lane, they are able to reuse about 70% of the sand that they bring in for cow bedding.

Environmental impacts of manure

The major complaint with manure is its smell. One of the things that the Michigan Agriculture Environmental Assurance Program (MAEAP) tries to address is to help farmers with techniques to help reduce the odor. Injecting the manure into the soil, or incorporating it immediately after spreading are both helpful. Installing windbreaks, paying attention to wind direction, and just being aware of neighbors are also helpful.

Another concern is runoff. Manure has a tendency to run off fields when there is a lot of rain or snow melt. In order for a farm to meet the best management practices set out by the Right to Farm law, the farm should not spread manure when it's pouring rain, and not spread manure during the winter if it can avoid it. There are times in winter that farms have to spread manure in an emergency situation.

Soil phosphorus levels need to be watched when managing manure. When soil tests indicate there are more than 300 pounds of phosphorus per acre in the soil, no additional manure should be applied to that field. This is because at those levels, the phosphorus can move out of the soil and into waterbodies. Phosphorus in water, weather from manure or fertilizer, can cause algae to bloom in lakes, like the ones seen recently in Lake Erie.

Jodi DeHate, the MAEAP technician serving Missaukee, Wexford, Kalkaska, and Crawford Counties, can help farms identify ways that they can best manage their manure. If you have questions about MAEAP, manure management or anything agricultural related, give Jodi a call at 231-839-7193 or

email her at jodi.dehate@macd.org. Jodi is also looking for more ideas for articles, and would welcome your suggestions!

All photos were taken by Wexford Conservation District Staff



A John Deere “manure boat” is essentially a large air compressor outfitted with nozzles. It homogenizes the solids and the liquids so that they can be hauled and spread on crop fields where it can provide both nutrients and organic matter to the soil.



Sand in this pile has been dried and tested, and is now ready to be re-used as bedding for the cows.

This photo has been cropped



A concrete “sand lane” can be used to help separate sand from liquid manure, saving both the need to purchase more sand and wear and tear on pumping equipment.



Ryan Benthem of Benthem Brothers farm in MacBain getting ready to spread manure on the farm. The manure will improve both the organic matter and the fertility of the soil.