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Special points of interest:

- New publications, “Biosecure Nutrient Management Practices NM1551” and “Manure Spills: What You Need to Know and Environmental Consequences NM-1555” are now available on the web and at county offices.
- We are still sampling and testing manure for nutrients. If you are interested contact Teresa, 701-483-2348 or Chris, 701-652-2951.

Summer Management Tips

Now that field work is underway, it is important to remember some summer management practices that may get overlooked. This issue has some information on summer containment pond management, reducing pen odors and composting manure.

Many containment ponds may be close to full after the snowy winter and wet spring. Applying the effluent to a field is a great way to manage the water (page 4).

Spring manure applications may also have been overlooked with the late planting dates across the state. Some facilities may be near full capacity for manure storage. Composting that manure can reduce the volume by at least half. The compost will likely need to be applied this fall, but

composting can buy you some storage time and reduce hauling costs (page 3).

Two publications, “Manure Spills: What You Need to Know and Environmental Consequences NM-1555” and “Biosecure Nutrient Management Practices NM-1552” are now available. In these publications, you will find information on cleaning up a manure spill, manure spreader cleaning, and more.

If you would like to have your manure tested for nutrients, let Teresa or me know. We’d be glad to come out and sample your manure.

We are also in the process of planning this year’s Compost Demonstration Day. It will be in August. You will be notified when details are finalized.



Applying pond effluent with a traveling gun.

You may distribute this in any manner you see fit. If you would like to receive future copies, email me (chris.augustin@ndsu.edu) to be added to the list.

We are always looking for different topics to cover. If you have an idea or an article you would like to submit, email it to me and I will accommodate.

Thanks for reading,

Chris

North Dakota Stockmen’s Association Feedlot Tour in Southeastern North Dakota

The North Dakota Stockmen’s Association (NDSA) Feeder Council will host its ninth annual Feedlot Tour in southeastern North Dakota on June 21. Buses will depart from the Buffalo Mall parking lot in Jamestown at 8 a.m., CDT.

“The tour provides fellow feedlot operators and others a chance to see some of the latest advancements in feedlot

construction, as well as better understanding of the environmental precautions taken in the development, management and maintenance of modern-day feeding systems,” said NDSA Feeder Council Chairman Jamie Hauge of Carson. “This is an excellent opportunity for those who are interested in North Dakota’s feeding industry to come and take a look.”

The bus will return to Buffalo Mall parking lot in Jamestown around 6 p.m.

The cost to participate is \$15 per person, which includes bus transportation and lunch. Pre-registration by June 17 is appreciated. To pre-register, contact NDSA Environmental Services Director Scott Ressler at (701) 223-2522 or sressler@ndstockmen.org.

Cattle Feedlot Odors Can Be Controlled



Monitoring hydrogen sulfide emissions from a containment pond.

“Proper feedlot design and management are the keys to keeping smells to a minimum.”



CREC Livestock Research Technician, Dale Burr lectures at a past field day.

“Feedlots do not need to smell,” says Karl Hoppe, area Extension Service livestock specialist at North Dakota State University’s Carrington Research Extension Center. “Feedlots may have a slight odor, but they do not have to have an overwhelming odor.”

Proper feedlot design and management are the keys to keeping smells to a minimum, he adds.

One of those management tools is pen stocking density.

“Don’t overcrowd the pens,” advises Ron Wiederholt, NDSU’s nutrient management specialist at the Carrington center. “This may not be easy since most producers want to maximize pen space, but during hot weather, this may not be good for the cattle nor the condition of the pen.”

High stocking rates lead to wetter pen surfaces from the cattle’s urine. Overcrowding also can degrade the pen’s surface, resulting in wallows and potholes that stay wet.

Carrington Research Extension Center: July 19, phone: 701-

Rainfall that collects in pens is another odor causer, according to Hoppe.

“Whenever you have water mixed in with manure, you have odor,” he says.

Wiederholt recommends keeping pen surfaces uniform so they don’t develop low spots where rain and urine can collect. Feedlot operators also should scrape and remove manure from pens more often during hot weather.

“Frequent scraping and removal of manure from pens is probably the most effective management tool for odor control,” he says. “If you can’t afford to decrease pen stocking density, then you must increase the frequency of pen scraping and manure removal.”

However, feedlot operators have to find a place to put all that manure. They’ll need to have a temporary manure stacking area since they won’t have a place to spread it at this time of year.

The temporary storage area can

be in the corners of fields where the manure will be spread after the crops are off. But producers will have to make sure the sites they chose for the piles have a low risk of runoff, Wiederholt says.

For more information about managing livestock manure, check out NDSU Extension publications NM-1297, “Producers Guide to Livestock Manure Management Systems,” and NM-1320, “Resource Guide for Livestock Manure Management.” Also visit the Web sites at <http://www.mwps.org> and http://www.ag.ndsu.nodak.edu/carringt/waste_mgmt_program.htm for more information on livestock waste management.

Karl Hoppe, NDSU Area Livestock Extension Specialist

Ron Wiederholt, NDSU Area Nutrient Management Extension Specialist

Ellen Crawford, NDSU Agriculture Communications

Research Extension Center Field Days

Every summer the NDSU Extension Research Centers hold a field day. These events allow center personnel to share their research and educational efforts with the public. The dates have been set and agendas are being planned.

Carrington Research Extension Center: July 19, phone: 701-

652-2951

Central Grasslands Research Extension Center (Streeter): June 29, 701-424-3606

Dickinson Research Extension Center: July 13, phone: 701-483-2348

Hettinger Research Extension Center: July 12, phone: 701-

567-4323

Langdon Research Extension Center: July 21, phone: 701-256-2582

North Central Research Extension Center (Minot): July 20, phone: 701-857-7679

Williston Research Extension Center: July 14, phone: 701-774-4315

Composting Reduces Manure Volume

North Dakota’s long, cold winter has led to larger than normal accumulations of manure and bedding, and may delay producer’ fertilizer application.

Producers typically apply manure as a fertilizer in the spring before planting and in the fall after harvest. However, many producers may skip the manure application this spring. That could result in manure storage facilities reaching full capacity.

Composting is a possible solution to the manure storage problem, according to Chris Augustin, nutrient management specialist at North Dakota State University’s Carrington Research Extension Center.

Composting kills weed seeds and pathogens, and reduces manure volume. Research indicates that composting reduces manure pile by half to two-thirds. This reduces hauling costs because producers end up with less and lighter material to apply on the field.

“Composting is more than piling manure and letting it sit though,” Augustin says.



After 24 hours of manure piling, the temperature has reached 130 F.

“Composting is a speedy decomposition process. The bacteria and fungi responsible for the composting are indigenous to the pile. It is our job to create a habitable environment for the decomposing organisms.”

Manure compost requires 20 to 40 parts of carbon for every part nitrogen. This is equal to about 80 percent cattle manure and 20 percent straw bedding. Manure is the nitrogen source and straw is the carbon source.

The compost pile also must have adequate air and water. Fifty percent of the pore space needs air and the remaining 50 percent needs to be filled with water. The pile should feel like a well wrung-out rag, Augustin says. If water drips out of a handful of compost, it is too wet. If it doesn’t feel damp to the touch, then it is too dry.

After piling compost, the pile should heat to more than 130 F in two or three days. If the pile does not heat, then one of the four factors (carbon, nitrogen, air, and water) is not in the pile in the recommended amount. The temperature should remain above 130 F for a couple weeks, then decline. Once the temperature falls, the pile needs to be turned.

Producers can buy implements designed for turning compost, but turners can be expensive. One alternative is to use bucket tractors to turn piles. Also,

Soil Conservation Districts in Wells, Stutsman, and LaMoure counties offer custom turning services.

Turning the pile introduces oxygen into the compost and will stimulate the microbes in the pile to continue heating.

“The idea is to mix the pile by moving materials from the outside of the pile to the inside of the pile while adding air to the system,” Augustin says.

The duration of the subsequent heating cycles will shorten with each turn. After three to five turns, the manure is composted.

Augustin suggests letting the compost sit for a few weeks to allow it to cure. Applying compost that has not cured can cause phytotoxicity issues. Once the pile has assumed ambient temperatures, it is ready to be used as a fertilizer.

However, compost needs to be sampled for nutrients before it is applied on a field. About 15 percent of the total nitrogen, 30 percent of the total phosphorus and total potassium in the compost should be available to the crop that’s planted.

Producers who would like their manure compost tested for nutrient may contact Augustin at (701) 652-2951 or chris.augustin@ndsu.edu

Chris Augustin

Ellen Crawford, NDSU
Agriculture Communication



Initial manure piling for windrow composting.

“It’s our job to create a habitable environment for the decomposing organisms.”



Finished compost (80 days later) from manure windrowing.

NDSU Extension Service North Dakota State University

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We're on the Web!

www.ndsu.edu/nm

Summer is The Time to Manage Containment Ponds

Containment ponds in livestock systems are designed to collect runoff and lose water to evaporation. However, during wet years containment ponds periodically need to be emptied. Applying pond effluent to crop or pasture land prevents overfilling of the containment pond. Overfilling may lead to a surface water discharge that can erode away the pond and cause environmental issues. The pond may require costly extensive dirt work to be fixed. A common method of emptying a pond is to utilize the effluent for irrigation water using a traveling gun.

High containment pond levels likely occur during the spring thaw. Finding a suitable application site during the spring can be difficult. Saturated soils are common and this can increase runoff risks. The best time to manage a containment pond is during the summer when evaporation is greatest and soils tend to be the driest.

It is important to not apply effluent at rates greater than a soil's infiltration rate. Soil infiltration rate is predominately determined by soil texture and topography. Finer texture soils, such as clay will infiltrate more slowly than coarsely textured soils. Soil compaction from field equipment traffic or naturally occurring from sodium filled horizons can lower soil infiltration rates. Water infiltration is fast on dry soil, but slows as it saturates and approaches field capacity.

Slopes affect soil infiltration rates because of runoff. Steep slopes increase runoff, whereas shallow slopes have less runoff.

It is recommended to apply effluent on slopes less than 6%. Caution needs to be taken when applying containment pond effluent near surface waters. The effluent cannot be applied closer than 100 feet to a down-gradient surface water, open tile line intake structures, or well heads.

Infiltration rates of various soils.

Soil Type	Steady infiltration rate (in/hr)
Sands	>0.79
Sandy and silty soils	0.39-0.79
Loams	0.20-0.39
Clayey soils	0.04-0.20
Sodium clayey soils	<0.04

Adapted from Hillel, D. 1998. Environmental soil physics. Pg. 403. Academic Press, San Diego, CA.

The effluent must be applied to meet crop nutrient needs. Small amounts of nutrients can be found in containment pond effluent. Excess nitrogen and phosphorus in surface water can cause algae blooms and lower water quality. However, excess potassium in surface water does not lead to algae blooms.

Proper containment pond management is an important piece in a nutrient management plan. Utilizing effluent water as an irrigation source is a good use while lowering containment pond levels.

Chris Augustin

Average amount of nutrients from 12 containment ponds in Barnes County, ND.

	---lbs/1000 gal---			pH	Ms/cm Electrical Conductivity
	N	P ₂ O ₅	K ₂ O		
Average	0.17	0	3	8.36	1.82

Results courtesy of Lori Frank, Barnes County Watershed Coordinator.

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