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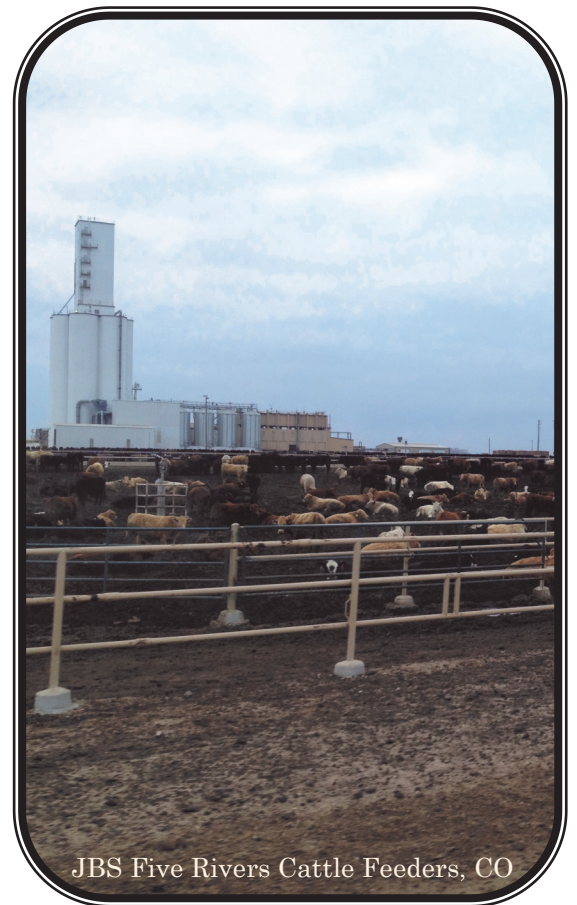
**LIVESTOCK ENVIRONMENTAL MANAGEMENT
IMPROVING WATER QUALITY AND
NUTRIENT MANAGEMENT
IN NORTH DAKOTA**

Waste to Worth, An Eye Opening Experience

This April, Mary and Emily traveled to Denver, Colorado to attend the first ever "From Waste to Worth; 'Spreading' Science & Solutions" Convention. The week was focused on research, education and Extension, centered on managing environmental impacts of livestock and poultry production. Over 235 experts, businesses, government officials, and university personnel attended.

Day one of the convention was filled with tours of local dairies, a poultry farm, and a large feedlot. The first stop took us to Morning Fresh Farms (MFF) where 750,000 eggs are produced daily. Morning Fresh Farms has both conventional and cage-free egg production on approximately 1,100 acres in Northern Colorado. The

production system used at MFF is 100% inline, meaning that egg gathering and processing is fully automated. 62,500 dozen eggs are collected, washed, candled, packaged and refrigerated daily. One of the more unique features of MFF is their nutrient management system. Manure produced by the hens immediately drops onto a concrete floor under their cages and is removed from the barn every three days. The manure is either immediately dehydrated or composted with shredded wood for use by a subsidiary company for lawn and garden fertilizers. On average, the operation produces \$16 million in fertilizer and \$23 million in eggs annually.



JBS Five Rivers Cattle Feeders, CO

Article continued on page 3



Turbin Drive water reel

Barnes County Traveling Gun

Barnes County is fortunate to have secured EPA Section-319 grants to address local water quality issues, with the Sheyenne River watershed the focus area for the first grant dollars awarded. The most recent grant was written to address areas in one-half mile of the Sheyenne, James and Maple Rivers, as well as their tributaries within Barnes County. Grants provide technical and financial assistance to landowners for Best Management Practices (BMPs) that protect or enhance water quality.

Article continued on page 3

Using Grid Soil Sampling to Guide Manure Application

Les Everett - Water Resources Center Education Coordinator, University of Minnesota, Randy Pepin and Jose A. Hernandez - Extension Educators, University of Minnesota - Extension

Using grid soil sampling to guide manure application can be a profitable investment, is the conclusion from case studies based on eight Minnesota farms. In fields where there is a history of non-uniform manure application, targeting new manure applications to areas with lower phosphorus and potassium soil test values can result in considerable economic returns above the cost of grid soil sampling. Variable rate manure applicators are not required when fields can be divided into application and no-application zones, with supplemental nitrogen fertilizer in the no-manure zones. The brief case studies are available on the University of Minnesota Extension web page for Manure Management and Air Quality <http://www.manure.umn.edu>, under Grid Soil Sampling for Manure Application. An introduction, the eight case studies, and a set of short video presentations based on the case studies are available at <http://z.umn.edu/gridsoilsampling>.

Source: <http://blog.lib.umn.edu/efans/manure/2013/05/using-grid-soil-sampling-to-guide-manure-application.php>



Advancing sustainable agriculture since 1988!

SARE (Sustainable Agriculture Research and Education) is a nationwide federal program which embraces three broad goals for sustainability: 1) Profit over the long term, 2) Stewardship of our nation's land, air and water, and 3) Quality of life for farmers, ranchers and their communities. Please check out the internet site: <http://www.sare.org/>

North Central SARE provides competitive grants through five grant programs: Farmer Rancher, Research and Education, Professional Development Program, Graduate Student,

and Youth Educator. For more detailed information on these grants, please go to : <http://www.northcentralsare.org/Grants/Our-Grant-Programs>

North Dakota SARE is focusing on three initiatives during the 2013 plan of work: Focus on Soil Health, Scaling up Local Foods, and Carbon, Energy, and Climate. If you are interested in learning more about SARE and developing a local SARE program or project, please consider the North Dakota SARE Professional Development Mini Grants.

If you have a sincere interest in SARE programming and would like to learn more about SARE educational opportunities please fill out the application form located at the web address below.

More information about ND SARE and ND SARE Professional Development Mini Grants (and the application form) is found at: <http://www.northcentralsare.org/State-Programs/North-Dakota>

Travel cost share maybe included when submitting an application.

A wide variety of SARE information and SARE educational resources can be found at <http://www.northcentralsare.org/>

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Local Buzz.....ND Stockmen's Association

By Scott Ressler – Environmental Services Director

With the rain that the state recently received, operating a feedlot can be tough. The rain can add stress to the cattle and feedlot operators. As operators we can reduce the stress on animals by maintaining adequate pen space per animal and pen slope. Maintaining pen slope can be accomplished with the aid of a box scraper, which works better than a loader bucket as it keeps the level of existing ground and doesn't gouge into the ground as a loader bucket would. The box scraper can not only be used for some dirt work but also for regularly cleaning and scraping of pens. There are economic and production benefits from producing cattle on clean, well-drained pens.

Proper maintenance of the pen surface is important for animal health, welfare, and productivity. A little "housekeeping" can go a long way to improve the appearance of the feedyard, especially with an opportunity to custom feed for a new client.

Upcoming Events:



- June 18..... NDSA Feedlot Tour
- July 8..... NDSU Streeter REC Field Day
- July 9..... NDSU Hettinger REC Field Day
- July 10..... NDSU Dickinson REC Field Day
- July 11..... NDSU Williston REC Field Day
- July 16..... NDSU Carrington REC Field Day
- July 17..... NDSU Minot REC Field Day
- July 18..... NDSU Langdon REC Field Day
- August 13..... Nutrient Mg. Day, Carrington REC
- August 21..... Manure Expo - London, ON

SR 150 Nelson Gun



Traveling Gun...continued

A substantial number of cattle producers across the state have installed full manure management systems with assistance from the 319-program, and EQIP, and now meet all the North Dakota Department of Health (NDDoH) rules and regulations. Manure management systems may be comprised of dirty/clean water diversions, dikes, access roads, solid separators, clay liners, and containment ponds. Other components involved are water pipelines, tanks, fences and windbreak.

Containment ponds are designed to store a 25-year, 24-hour event, as well as the average annual rainfall and snowmelt. During 2011 and 2012, large amounts of snow and excessive rains created numerous problems for livestock producers.

Containment ponds were backing up into the lots and placing excessive pressure on containment structures. Options for lowering effluent levels are extremely costly or unfeasible, because of the labor involved.

These predicaments led to the purchasing of a traveling-gun irrigation system. Barnes County District personnel deliver and help set-up the system, which consists of a Kifco PTO-driven pump with an air purging unit; Four, 660 foot lengths of lay-flat mainline hose; a T40-1250 Turbin Drive water reel; and the SR 150 Nelson Gun. Spreading the effluent in this manner, following soil infiltration rates, remains compliance with the NDDoH regulations. Effluent can be disposed of on cropland, pasture or hayland.

The system is able to pump approximately 500,000 gallons in 24 hours. Pond samples may be tested for nitrogen, phosphorus, potassium, pH and electrical conductivity (salts). Test results show varied small amounts of these nutrients which will not cause damage to crops if applied according to infiltration rates. In three seasons the gun has traveled to 30 sites in 9 surrounding counties.

Waste to Worth...continued

Our next stop was at Shelton Dairy. This dairy utilized three separate production systems (dry lots, free-stall barns and compost barns) for their 2,400 milking cows. We found the compost barn the most interesting as far as manure management is concerned. The compost barns housed a 4-foot bed of compost that is aerated regularly with a cultivator when the cows are in the parlor. After approximately 14 months, the compost is removed as a completed product and applied at agronomic rates to crop fields.

JBS Five Rivers Cattle Feeding was stop number 3 where 95,000 head are fed annually at the Kuner site. This massive feedlot is equipped with industrial sized sprinklers to control dust and a feed mill to keep up with the over 2 million pounds of feed fed daily. This cattle feedlot also featured a recently re-engineered runoff collection system to maintain environmental quality.

Aurora Organic Dairy Farms was the final stop on the tour. This company manages 2

dairies in Colorado and two more in Texas. The first farm we visited uses a vacuum system to collect manure. The manure is mixed with fiber and composted. A requirement of being a certified organic dairy includes an intensive grazing system and exercise pens for the cattle. We also visited their second site, currently under construction. They were lining a nearly 28 million gallon containment pond with plastic. That's a lot of dirty water!

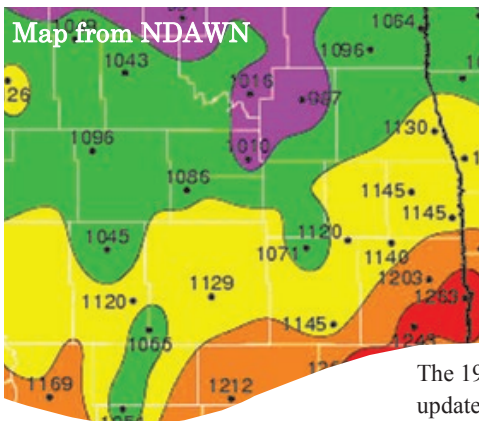
The rest of the week was spent listening to speakers cover a variety of topics that included air quality, water management, phosphorous and the environment, small farms, manure management, and more. It was a great chance to network with professionals from other states and bring ideas back to North Dakota. Select presentations and sessions were recorded and can be found online at <https://learn.extension.org/events/1022>.

Some producers are making long-term plans for easier pumping by planting hay land adjacent to their containment pond. They have found that the extra moisture, along with small amounts of nutrients, gives the crops a definite boost. Engineers are also taking this into consideration when designing lots. The district charges \$600 for delivery, set-up, disassembly, and pick-up for out-of-county producers and \$200 per day for usage. The majority of ponds can be pumped down within 2 or 3 days.

For more information about renting the traveling-gun irrigation system, contact Lori Frank at 701-845-3114 extension 3. Also, check out the NDSU Extension publication NM-1626 "Containment Pond Management" found here: <http://www.ag.ndsu.edu/pubs/ansci/waste/nm1626.pdf>.

Morning Fresh Farm Eggs





NDAWN Going Wireless

Near real-time weather data can be accessed through computers and smartphones.

The North Dakota Agricultural Weather Network (NDAWN) has begun offering near real-time data that can be viewed from any Web-browsing device, including smartphones.

This service is available at 19 of NDAWN's 72 stations. The service eventually will be available from all of the stations across North Dakota and the border regions of surrounding states. Providing this information through computers and smartphones replaces the system that allowed access to the data through a landline or basic cell phone call. The phone call option will be available at the other 53 stations until the technology is upgraded.

"Growers quickly learned the value of that earlier service," says Adnan Akyuz, state climatologist and assistant professor in the School of Natural Resource Sciences at North Dakota State University. "Today, NDAWN is working to accommodate changing technology to provide the best service to growers and our ever-growing NDAWN user base."

The 19 stations are providing updated data on the Web every 10 minutes at <http://ndawn.ndsu.nodak.edu/ten-minute-data-summary.html>. The data includes the day's maximum and minimum temperatures, air temperature from the previous 10 minutes, wind direction, average and maximum wind speed, relative humidity, dew point and bare-soil temperature. Also, the average wind chill temperature will be available from Nov. 1 through March 31, and total rainfall is available from April 1 through Oct. 31.

For information on how to link an NDAWN station's 10-minute data page to smartphone or Android device home screens, visit <http://ndawn.ndsu.nodak.edu/help-smartphone.html>. A wireless network is secure, reliable and fast, according to Akyuz.

"Downloading data from a wireless modem takes a fraction of a second, and we can download data from multiple stations simultaneously," he says. "Plus, near real-time data can be viewed simultaneously by multiple users around the world, and downloading data is free, while you have to pay a long-distance charge to call a station."

The new technology also means NDAWN will have more options for where it places new weather stations because the location won't be dependent on whether a landline connection is nearby.

However, the service has some disadvantages. One of them is that some producers still use basic cell phones, and people without Internet access in the field will not have access to the near real-time data.

"We are looking into possibilities of text-to-voice capability to accommodate those who do not have Web access," Akyuz says. "The biggest disadvantage that we are striving to overcome is power usage," he notes. "The cell modems use more power. Therefore, we must limit the online 10-minute data to daylight hours, at least for the time being."

From April through October, data will be available from 5 a.m. to 10 p.m. CDT. The winter schedule from November through March is 8 a.m. to 5 p.m. CST.

NDSA hosts feedlot tour in central ND

Photo: NDSA



The ND Stockmen's Association will be hosting the 11th annual feedlot tour in the Harvey area. The tour has been a highlight of the summer for people interested in feeding cattle. The tour features four progressive feedlots that have taken proactive steps to environmental compliance as well as implementing bunk line feeding systems and updating their feedlot fencing, wind-break fencing, water tanks and processing facilities. The cost of the tour is \$10 and to pre-register contact Scott at 701-223-2522 or sressler@ndstockmen.org. For additional information on the tour visit www.ndstockmen.org.

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