Our corn crop really doesn’t need a lot of nitrogen fertilizer until the month of June. At the V-6 or six leaf corn stage we would only have about 10# per acre of nitrogen in the corn plants. Then the corn demand goes up rapidly. However, sometimes the nitrogen source for that crop was applied eight months before that. Does that create risk? In some years, yes.

In this article we will Nitrogen losses that could exist after we have N in the soil, but before the crop might need it (as opposed to losses of nitrogen from the application time period). There are two main forms of N in the soil for much of the year. The first is ammonium. This is what is applied when we use anhydrous, and is also what makes up about three-quarters or more of the nitrogen found in liquid swine manure. Ammonium is the form we would prefer in the soil – the crop can take it up, and it is not subject to losses from leaching away from the area where it is applied, nor is it subject to denitrification (loss back to the atmosphere as nitrogen gas) that can happen in saturated soils.

The other main form of nitrogen is nitrate – which is the form plants usually use. Nitrate is also the form that is water soluble, which means it can leach away from where we put it, or it can be lost as nitrogen gas when the soil is totally saturated. This is the risky form of nitrogen, but the form it is present as for most of the year. That is why we are concerned about losses in wet seasons.

Ammonium is converted to nitrate via nitrification. The conversion of ammonium to nitrate and the conversion of nitrate to N gases are both microbial processes. Therefore, potential N loss is dependent upon factors that influence each – for nitrification soil temperature is very important (faster with warm soils, slower with cold soils); for denitrification soil temperature, soil moisture (only occurs when soils are saturated – anaerobic conditions) and readily available organic matter for an energy source. If fertilizer N is applied in the nitrate form, then that N is immediately subject to these loss pathways.

Greater losses occur when soils enter the spring season with recharged subsoil moisture, when more N is in the nitrate form, and when soils are warm.

Leaching and denitrification are not uniform across the landscape. Thus, the potential for N loss is variable and difficult to predict. For example, with high intensity rains, runoff occurs and not all of the water soaks into the soil. Instead, water in excess of infiltration moves to the lower landscape where it may form ponds or spill over stream banks into floodplains.

If an N source was applied in the spring that has more rapid nitrification than anhydrous ammonia (urea, ammonium sulfate, ammonium in manure) or contains part of the N in the nitrate form (ammonium nitrate or UAN solutions), then conversion to nitrate would be faster. Conversely, if an ammonium-containing fertilizer (anhydrous ammonia, urea or ammonium sulfate) or manure was applied shortly before a wet period, then loss would be negligible because little nitrification to nitrate would have occurred because nitrification does not occur in saturated soils and will not resume until soils dry and become aerobic.

Conversion to nitrate does not equal loss; it just means the N is susceptible to loss. Rapid and large losses occur only with excess leaching or with saturated soils.

Fall N applications should be done when the soils are cool (below 50 degrees and falling at the 4” depth), and should be done in the ammonium or ammonia form. This reduces the amount of N that will move to nitrate (the form that can be lost) before winter, so springtime soil inundation causes less risk. Early applications of ammonium N in the fall when soils are warm will likely convert to nitrate before we get to winter (early manure applications for example.) If we have a wet early spring, or a wet April, then loss potential is higher in those fields. Applying closer to when the corn needs the crop would be more ideal.

What’s the good news for N loss for 2012? Right now we are dry. Last year at this time our soil was full, and loss potential was quite a bit higher. However, we never know when we will get excess water in our soils – and the N loss that can go with it. Manage to reduce the risk, even in dry years.
Cooling Grain this Fall
By Kris Kohl – ISU Extension Ag Engineer Specialist

Cooling of corn and soybeans that will be stored is always important. They store much better at refrigerated temperatures than being above room temperatures. With the hot and dry conditions experienced this fall, cooling is even more important. Turn on the fans when the temperature is below 40°F and then off in the morning when the temperature rises up to 40°F. This cooled grain should keep well into May. Turn on fans at night until the top grain is 40°F or below in the morning. One or two nights of this chore is all it normally takes.

If you decide to freeze the grain by running the fans when temperatures are -20°F, the grain will keep fine, but warming it up in the spring is very important. If you sell the grain without warming it, you will get false high moisture readings that will cause dockage, drying charges and shrink charges.

Even so, it is best to check stored grain at least every two weeks during the winter and once a week in warmer weather. To do a good job checking grain, inspect and probe the grain for crusting, damp grain, and warm spots. Also, run the fan for just a few minutes and smell the exhaust air for any off odors. For more details, order a copy of “Managing Dry Grain in Storage” AED-20 from Midwest Plan Service at http://www.mwps.org or check out more post-harvest grain information at: http://www.bbe.umn.edu/ExtensionandOutreach/FoodProductionandProcessingSafety/Post-HarvestHandlingofCrops/index.htm

Pumping Swine Pits with Foam
By Kris Kohl – ISU Extension Ag Engineer Specialist

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We continue to receive a lot of reports regarding foam on swine manure pits. This foam comes from bacteria that are digesting the manure solids at the bottom of the pit. We don’t have all the answers on what is causing this foam and how to get rid of it in a hurry. The big concern is that the gas in the foam is 40% CO₂ and 60% methane. When the foam breaks, the methane is much lighter than air and goes up to the ceiling while the CO₂ is slightly heavier than air and stays at the bottom of the air space.

If the curtains are up, explosions and fires have occurred destroying buildings, equipment, pigs and people. Use extreme caution when pumping these pits to prevent this damage. The following points should be followed to reduce the risk when pumping those pits:

- Make sure both curtains are down at least 6 inches if windy and all the way down if calm to carry the methane out of the building.
- Shut off heater pilot lights or sparks from light switches or fan welders.
- Don’t agitate the foam with the jet from the upper jet blowing into the foam. This agitation will break up the foam very quickly and several of the explosions have occurred with sudden reduction in foam. Reports from producers who have pumped these pits with no agitation at all have reported little or no solids because of the natural agitation associated with the foam.
- Put tags on the building doors warning others to stay out during this time to reduce the risk.

Swine Issue Updates
By Dave Stender – ISU Extension Swine Program Specialist

This fall I have had the opportunity to attend a couple of swine conferences to hear about the latest issues impacting the swine industry. There is plenty happening in the swine industry these days.

At the George Young Conference, I listened to discussion of metabolic bone disease in swine. This disease causes bone formation disruption. It can be gradual or sudden, caused by deficiencies in calcium, phosphorus, Vitamin D, or hormonal problems. Little attention has been directed toward this disorder for decades because of advancements in swine nutrition science. However, this bone disorder has regained attention this past year. There have been recent cases with high morbidity and mortality presented to the ISU Veterinary Diagnostic Lab. Interesting results from the recent research reported that weaned pigs typically have very low levels of serum Vitamin D, with the exception of pasture raised pigs. That is because pigs exposed to sunlight are able to synthesize their own Vitamin D.

Additionally, we heard good reminders that feed waste is much more important when the price of feed is high. A typical feeder will deliver about $12,000 worth of feed per year with high feed prices. Every one percent feed waste will cost the operation $120 per year. If a feeder lasts 5 years, then a 1% improvement in feed wastage will pay for a $600 investment in a more efficient feeder. Producers are spending more time adjusting feeders to get that $600 return for every one percent improvement. Some producers report 10% less feed wastage with more intensive feeder adjustment. The other common practice used to improve feed conversion is to grind the feed finer. Every 100 microns finer grind saves 1.2% more feed. Producers are figuring out how to handle feed ground to 500 to 600 microns because finer ground feed does not flow as well.

Porcine respiratory reproductive syndrome (PRRS) is a consistent topic at swine production seminars. It is a disease that only impacts pigs and causes no human health concern. A new study estimated the annual cost of the disease at $664, million, up from the previous study showing $560 million.
cost. Therefore, researchers are actively developing new ideas to manage this disease. The possibility of eradicating PRRS is being studied. The testing of the disease has new options such as hanging cotton ropes in the pen instead of bleeding pigs; sow herds in pig-dense areas are filtering barns; herd cleanup plans have been developed; bio-security understanding and implementation is increasing; and new vaccination programs are being tested.

On the reproductive side, studies were discussed concerning the effectiveness of reducing the semen numbers in artificial insemination. Additionally, more talk about imprinting pointed to the importance of intrauterine spacing and pre-weaning competition on longer term reproductive efficiency and soundness in boars and reproductive females.

Other issues discussed included: a report on the carbon footprint of swine production (there has been a carbon footprint calculator developed), the safety of using antibiotics in swine production, taking precautions with flu, the comparison of individual sow housing and pen housing regarding the tradeoffs with each system, the effectiveness of euthanasia methods, and a report of water quality impacting pig performance.

There are many issues in the swine industry that are actively being addressed. We are thankful that the swine industry in Iowa is responding to the challenges with new and innovative ideas.

As harvest comes to a close, producers, ag lenders and suppliers turn their attention to planning ahead for the next production cycle. Help is on the way from Iowa State University Extension & Outreach. ISU offers valuable opportunities for producers and ag business professionals to get updated information to help make decisions that need to be made during the post-harvest period. The program dates and locations include:

Pro-Ag Fall 2011 Outlook Meetings Offered in Sheldon & Cherokee on November 8th, Carroll on November 16th
Melissa O’Rourke – ISU Extension Farm & Agribusiness Management Specialist morourke@iastate.edu 712-737-4230

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November 8 – 9 am at Sheldon – Northwest Iowa Community College – Life-Long Learning Center on Highway 18
November 8 – 1:30 pm at Cherokee – Western Iowa Tech Community College Center in Cherokee on Highway 59
November 16 – 1:30pm at Carroll – ISU Extension Office on Highway 30

The schedule is intended to give interested ag professionals a choice of times and locations for the half-day program.

The opening speaker will be Shane Ellis, ISU Livestock Marketing Specialist. Ellis will review the livestock profit potential, focusing on volatile beef and pork prices driven by demand and world economy factors, including exports, herd size and feed costs.

Melissa O’Rourke, Farm & Agribusiness Management Specialist for northwest Iowa will follow with an update and outlook on Iowa land values. Land values continue to be the talk of northwest Iowa, and O’Rourke will give a brief overview of where we’ve been, what’s driving these land prices, and where we might be headed.

The program will conclude with a keynote presentation by Dr. Chad Hart from the department of agricultural economics at Iowa State University. Although uncertainty abounds in the crop markets with questions about crop size and global demand, Dr. Hart projects that 2012 looks to be a profitable year for crop producers as prices are projected to remain well above production costs. Hart will explore the factors shaping the markets and the keys to watch as farmers market their grain over the coming year.

Prior to joining the Department of Economics at Iowa State University, Dr. Chad Hart was the U.S. Policy and Insurance Analyst with the Food and Agricultural Policy Research Institute (FAPRI) and a Scientist with the Center for Agricultural and Rural Development (CARD) at Iowa State University. His projections and outlooks are sought after by agriculture professionals across Iowa and the nation.

Registration for each of the meetings begins 30 minutes prior to the start times, and the programs will last about 2½ hours. The cost to attend the program is $20 at all locations.

Advance registration is recommended by calling the ISU Extension office hosting the meeting: Sheldon/Sioux County (712-737-4230); Cherokee (712-225-6196); Carroll (712-792-2364).
Animal Care and Handling Seminars for Beef and Dairy

Feedlot and dairy producers and their employees are invited to an Animal Care and Handling Seminar for Beef and Dairy on November 22 at Tri-State Livestock Auction in Sioux Center. Kip Lukasiewicz, assistant to Dr. Tom Noffsinger, nationally recognized expert in cattle handling, will discuss and demonstrate low-stress cattle handling techniques that improve cattle health and performance. Learn about techniques that not only enhance feedlot and dairy profits, but also ensure animal welfare and consumer confidence in the way meat and milk is produced. Two sessions will be held – one in the morning and another in the afternoon. The afternoon session will be offered in Spanish for Hispanic employees and operators. Participants attending either session will be Beef Quality Assurance certified. For more information, contact Beth Doran, ISU Extension Beef Program Specialist, at 712-737-4230 or doranb@iastate.edu.

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