



## News and Notes

### May 2015

#### *A Progress Report on the Northern Plains Nitrogen Fertilizer Production Facility*

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##### **From the President's Desk**

Earlier this month, an economic forecast received far less attention than it deserves. According to the U.S. Department of Agriculture's National Institute of Food and Agriculture (NIFA) and Purdue University, there are more than 57,000 high-skilled job openings annually in the food, agriculture, renewable natural resources, and environment fields in the United States. Yet, there are only about 35,000 new U.S. graduates every year with a bachelor's degree or higher in agriculture related fields.

U.S. Agriculture Secretary Tom Vilsack, commenting on the report, said this: "There is incredible opportunity for highly-skilled jobs in agriculture. Those receiving degrees in agricultural fields can expect to have ample career opportunities. Not only will those who study agriculture be likely to get well-paying jobs upon graduation, they will also have the satisfaction of working in a field that addresses some of the world's most pressing challenges. These jobs will only become more important as we continue to develop solutions to feed more than 9 billion people by 2050."

Vilsack's last comment is the one to which we should pay the most attention. According to a May report by the Iowa State Department of Economics, the world still looks to the U.S. for a good share of food production. For example, the U.S. is expected to produce one-third or more of the world's corn and soybeans in 2015-16.

To deliver on the demand, though, producers will have to become even more efficient as margins on crops are under increasing pressure. That will take new technologies and new skills. Farmers always have managed their operations to achieve the best economic outcomes while being responsible stewards of the land, air and water. Today, though, those twin goals are more important than ever.

In this month's newsletter, we take a look at how a key component of Northern Plains Nitrogen's business strategy will support this new market. Urea ammonium nitrate (UAN) will be an important product of NPN's new Grand Forks, ND, plant. The attributes of UAN can help farmers deliver the right nutrition to crops at the right time. And, as agriculture increasingly becomes a high-tech industry, farmers will be able to evaluate the nutrition needs of crops in areas as small as a few square feet, applying fertilizer only where and when it's needed.

Feeding the world and protecting the environment always have been priorities. In today's world, though, meeting both challenges will require more highly-trained professionals, as Secretary Vilsack says. NPN is proud to be part of a future for agriculture that never has been more exciting.

Sincerely,  
*Darin Anderson*  
Darin Anderson  
President, NPN Board

## **NPN Strategy Promotes Crop Yields and Clean Water**

Too often in today's contentious political environment and 24/7 media whirlwind, complicated issues get boiled down to simplistic and polarizing positions. Supreme Court Justice Felix Frankfurter – appointed to the Court by President Franklin Roosevelt with the expectation that his rulings would expand government became the leading advocate of judicial restraint – said, “Anybody can decide a question if only a single principle is in controversy.”

That is a worthwhile caution to heed in the growing debate over the use of nitrogen fertilizer and water quality. The choice isn't “either-or”; it's “and.” Nitrogen is an essential building block of plants. It is necessary nourishment to produce the crop

yields needed to feed a growing global population and, in the case of a crop like corn, to assure a sufficient supply for the expanding industrial and energy uses, many of which have important environmental values.

At the same time, though, nitrate accumulation in surface and groundwater is increasingly becoming an issue, drawing greater scrutiny from local, state and federal regulators and advocacy groups. More and more, the issue is pitting environmental activists and others against farmers. And, in too many cases, opponents of nitrogen reduce the controversy to a single principle, water quality.

In fact, the issue is more complicated and fair solutions are possible. Some background is important. Nitrogen is abundant in nature. In fact, about 80 percent of the Earth's atmosphere is nitrogen. However, plants and animals can't use nitrogen gas in that form. A variety of processes convert nitrogen into usable forms. Were that not the case, there would be no forests or native pastures.

Nature, though, doesn't always provide enough nitrogen or at the right times. That's why, while Northern Plains Nitrogen will manufacture several forms of nitrogen-containing fertilizers at its new Grand Forks, ND, facility, a key strategic focus will be to shift the prime market to liquid products.

In particular, NPN will emphasize urea ammonium nitrate (UAN), a clear liquid product containing 32 percent nitrogen in three different forms. The different forms create the environmental advantage for UAN over other nitrogen fertilizers.

Agronomically, the vast majority of nitrogen taken in by plants is in the nitrate form. UAN solution contains  $\text{NO}_3$  (nitrate nitrogen) which is ready for immediate uptake by the plants. It also contains urea, which needs to be broken down largely to  $\text{NO}_3$  over time for plant uptake. And, it contains ammonium ( $\text{NH}_4$ ) which takes even longer than urea to be ready for uptake by the plant. The result: with UAN, seeds have an immediate source of nitrogen and maturing crops benefit from the ongoing, gradual release of nitrogen.

UAN counters the problem that occurs when too much nitrogen accumulates in the soil. "If nitrate exceeds crop demand, nitrates can accumulate in the soil and water movement can carry the nitrates to surface or groundwater," said Cindy Grant, Ph.D., a soil fertility specialist with Agriculture and Agri-Food Canada. "Applying nitrogen fertilizer in the fall or early spring, when both nitrogen and water use by the plant is small, can allow nitrate to build up in the soil. Surplus water from snow melt or early spring rains can then carry the accumulated nitrate out of the rooting zone and into water bodies, especially in warm, moist environments."

While UAN releases  $\text{NO}_3$  over an extended time, flexible and precise application is important. UAN can be applied as soil or plant petiole samples dictate immediate needs. UAN growers can feed the crop as nitrogen is needed and as plants are able to remove it from the soil. In addition, UAN is becoming increasingly popular as variable rate, site-specific technology unfolds acknowledging soil productivity variability within a field, and optimizing potential down to grids of a few square feet.

Dr. Grant agrees, saying "...more intensive management, such as in-crop applications of UAN may be needed to reduce the risk of nitrate losses. Splitting nitrogen supply into repeated applications over the growing season will not only provide the nitrogen when uptake by the crop is rapid, but also allows a producer to eliminate nitrogen applications if poor weather reduces crop growth and nitrogen demand. Assessment of plant nitrogen status, with tools such as SPAD meters, plant tissue testing, or petiole testing, can guide the producer in deciding if nitrogen application is required."

UAN has other advantages, according to Dr. Julian Smith, director of Discovery and Innovation for BRANDT Consolidated in Springfield, IL. According to Dr. Smith, additional nutrients can be added to UAN, assuring that plants get the right nutrition at the right time. This has both agronomic and environmental benefits. "The inclusion of additional fertilizer salts in UAN solutions can further slow nitrification and those slow nitrate release to rates commensurate with optimal plant uptake. Time and N-use efficiency can also be enhanced by including UAN in irrigation water. Fertigation offers an additional benefit to stable N solutions by matching peak crop demand for nutrients and water during the growing season," said Smith

The bottom line: Productive agriculture and effective environmental stewardship are complicated challenges, but they are not competing goals. According to Dr. Grant, "Efficient nitrogen management using the 4R principles of right rate, right source, right timing and right placement can help the producer improve nitrogen use efficiency to improve both the environmental and the economic performance of the farming operation. "

NPN's production strategy is focused on helping farmers apply the right amount of fertilizer at the right time so that they can achieve the yield they need while protecting the quality of water important to everyone.

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