



FOLIAR FEEDING IMPROVES NUTRIENT USE

By Wayne Becker,
Southern Region Sales Agronomist- Texas

Spoon-feeding nutrients to developing grain crops will pay big dividends. This fact is being recognized by agronomists across the country. At the International Plant Nutrition Institute Great Plains Soil Fertility Conference, recently held in Denver Colorado, Pioneer Seed shared their observations of best management practices leading to top yields which they derived from 100+ corn variety trials in the Texas/Oklahoma/Colorado/Kansas/New Mexico from 2010-2013. To summarize greatly, they stated multiple nutrient application sites and timings leads to increased nutrient efficiency, increases in plant health and ultimately, increased yield.

The studies they referenced were on irrigated corn fields, but the theory could easily be extended to dry land corn and grain sorghum. Part of what Pioneer shared was information showing Nitrogen Use Efficiency is increased 28% with in-season nitrogen applications compared to pre-plant; specifically nitrogen use efficiency can be improved from 1.19 lbs of N/bu to 0.86 lbs of N/bu. according to studies which they cited. Rather than applying all of a crop's nutrients preplant, applications of nitrogen later in the growing season ultimately affect yield. Using the idea they presented about greater nutrient use efficiency with multiple applications, it is easy to see a correlation with foliar feeding. Foliar feeding with a high-quality nutrient source is an easy way to spoon feed the growing crop with multiple applications. Foliar feeding can be done in combination with glyphosate applications with no extra trips over the field; they can also be done in addition to side dressing or nutrient application through the pivot.

When investigating foliar feeding with other macronutrients, Oklahoma State University determined "foliar P applied at V8 growth stages and later, could be used as an efficient P management tool in corn." In addition, potassium is extremely critical. Plant tissue samples with adequate Potassium at V4 help grow healthier corn, while improving N efficiency and disease resistance. A balanced nutrient program increases the efficiency of all the nutrients.

These industry observations coincide with what NACHURS fertilizer has reported from in-season additions of high-quality foliar applications of **NACHURS SRN®** or **NACHURS N-Rage®**.

1. Average yield increases on trials during the 2011-2012 cropping seasons were 4.1 bushels (**NACHURS SRN®**; 19 studies) and 6.6 bushels (**NACHURS N-Rage®**; 41 studies).
2. A 3 year **NACHURS N-Rage®** foliar feeding study with the University of Nebraska yielded + 5.9 bu for v 5 applications.

The foundation of any fertility program should include banding a high-quality NACHURS NPK fertilizer in-furrow and soil testing to determine additional soil P and K needs. Foliar feeding is extremely beneficial for spoon feeding nutrients while simultaneously delivering other crop protection products to the field.

Applying nutrients with precision placement leads to proven performance. Spoon-feeding nutrients throughout the cropping season with NACHURS fertilizer leads to healthy crops and more flexibility for the farmer to adapt to growing conditions during the season.

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EVALUATING ALFALFA STANDS

By John Holdsworth,
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It has been a long winter and people are starting to ask the questions of alfalfa survival. Alfalfa survival from the winter is influenced by several factors including last year's growing conditions, temperature, soil type, snow cover, and winter-hardiness of the variety/hybrid planted. The decision on whether to keep a stand starts with an accurate stand assessment.

Here are some simple recommendations by universities for evaluating "New" and "Old" alfalfa stands. Plant counts can be used to help predict the productivity of the alfalfa stand. The plants should be actively growing with three to four inches of new growth before stands assessed. Using a sampling frame of one square foot can be randomly tossed (10-20 samples per 10 acres) in the field to take stand counts. Table 2 lists the minimum of healthy plants per square foot for a desirable alfalfa stand.

(1 Morrison, J. 2009 University of Illinois-Extension)

Another method, which is more accurate to assess established alfalfa stands is to count stems. Older stands tend to have fewer individual plants but more stems per plant. This method, use a 17 inches by 17 inches sampling frame or about a 2 square feet. Count the stems within the frame at 4 to 5 random locations in the field. Divide this number by 2 to get average stems per square foot. Use this number to estimate yield potential of the stand (Table 3). Regardless of the method used, you should also look at crown and root health. Your healthy plants will have large crowns that have many shoots growing symmetrically from the crown.

Table 2. Suggested alfalfa plants per square foot¹.

Production Year	Plants/sq ft
1	>12
2	>8
3	>5

Table 3. Average stem count and estimated yield potential.

Stems/ sq ft	Estimated yield potential
>55	100%
50	90%
45	81%
40	72%
35	62%
30	53%
25	44%

Source: Undersander, D. et al. 2011. Alfalfa stand assessment: Is this stand good enough to keep? AD620. University of Wisconsin Cooperative Extension

FERTILITY-ALFALFA MANAGEMENT CONSIDERATIONS:

It is essential to consider an alfalfa plant's N-P-K needs before fertilizing. Alfalfa typically gets enough nitrogen from its symbiotic relationship with nitrogen-fixing Rhizobium bacteria and from soil organic matter, which releases nitrogen as it decomposes. Testing soil P and K, and then fertilizing accordingly will ensure balanced soil fertility.

Alfalfa stores carbohydrates in the root system and the crown of the plant. High levels of carbohydrates promote rapid regrowth after each cutting and endurance during winter months. Foliar feeding is the most efficient and effective way to fertilize established alfalfa as it gets nutrients into the alfalfa plant quickly when plants need it the most. Foliar feeding with NACHURS liquid fertilizers provide available phosphorus and potassium to maximize carbohydrates reserves for improved yields, regrowth and alfalfa quality.

For maximum yields and early season plant performance, give your alfalfa crop the NACHURS Advantage:

- Maximizing carbohydrate reserves for top yields
- Increase relative feed value, crude protein and total digestibility
- Tank Mixes with insecticides and post spray applications
- * Quicker regrowth and improved quality
- * Optimizes plant health
- * Safe on plant foliage

Consult your NACHURS District Sale Manager or Agronomist for specific fertility recommendations.



MAXIMIZE PHOSPHATE EFFICIENCY WITH NACHURS IN-FURROW FERTILIZER

By Joe Pflum,
Eastern Region Sales Agronomist- Indiana

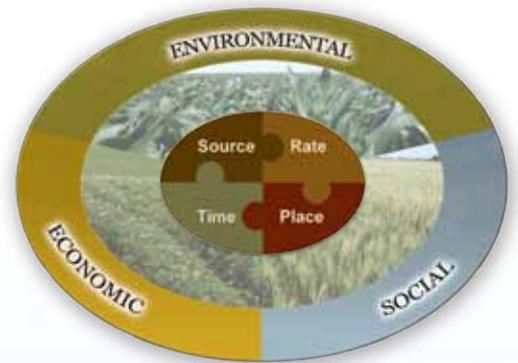
We have not yet reached the genetic yield potential of our corn hybrids. One factor that will limit yield potential is the availability of Phosphorus during a critical time of need. As we are planting corn earlier and into cooler, wetter soils, Phosphorus will be released slowly into the soil solution due to these conditions. Phosphorus plays a vital role during the early growth stages. These stages are outlined below:

GROWTH STAGE	DAYS AFTER EMERGENCE	GROWTH EVENT	IMPORTANCE
V3	9-12	Seminal root system and ear shoots initiated	Seedling vigor seen, ears established
V4 to V5	14-21	Ear shoot initiation complete	Number of kernel rows determined
V6	21-25	Nodal root system established	Plant's ability to take up nutrients and water is established

By placing NACHURS fertilizer with the seed during planting, we offer the proper balance of available nutrients for quicker, more uniform emergence that will also stimulate root growth. This will allow your corn to absorb more soil nutrients and moisture. This means: less use rate, faster planting and better yields.

NACHURS promotes applying fertilizer using the 4R's of Nutrient Stewardship concept which include:

- The Right Source
- The Right Rate
- The Right Time
- The Right Place



GOT CORN? GET NACHURS.



NACHURS SOYBEAN STRATEGIES FOR MAXIMIZING YIELD

By Brian Banks,
Regional Agronomy Manager- Nebraska

Soybean yields across the country have struggled keep up with corn yields in regards to rate of increase over the past thirty years. It has been documented by the USDA that the rate of increase for corn yield is roughly 1.6% while soybean is only 1.2%. Many industry and university personnel suggest this discrepancy exists mainly because many growers simply do not manage their soybean crop as diligently as they manage their corn crop. Fertility management in soybean is one of the most important factors that should be addressed in order to realize the yield potential of modern soybean varieties. One aspect of any fertility program is to build or maintain optimum soil test levels. Another, possibly more important aspect is to understand the nutrient needs of the current crop and to apply those nutrients at the optimum time and rate. This is where NACHURS fertilizer products and experience fit into the program.



Fig. 1 – NACHURS HKW6 vs Untreated

NACHURS encourages a three step approach to maximizing soybean yields and has developed and tested products based upon this strategy. The first step incorporates the use of **NACHURS HKW6®** as an in-furrow starter application at planting. **NACHURS HKW6®** is the industry's first soybean specific starter fertilizer product and is powered by NACHURS new Bio-K™ technology. Rates are determined by soil CEC and row spacing and are listed on NACHURS Product Reference Sheets. This application results in stronger emergence and increased early season plant vigor, especially in cool or wet soils. Additional benefits include stronger stems with more branching, which leads to increased light interception and early canopy as shown in Figure 1.

Step two focuses on a foliar potassium application during the late vegetative stages, typically V5 up to R1. NACHURS has many different formulations for this application that are high in potassium but also contain other nutrients to address specific needs of the crop based on plant tissue samples. Products recommended for this application include **NACHURS HKW6®**, **NACHURS HKW18®**, **NACHURS K20-N®**, **NACHURS K13-N®** or **NACHURS KA24®**. These products are applied at 1 - 2 gallons/acre and can be tank mixed with most crop protection

products. Benefits of this application include increased flower production which ultimately results in increased pod production. Assuring adequate potassium levels in the soybean plant helps to ensure plant health and has also been proven to inhibit the reproductive rate of soybean aphids in a University of Wisconsin study.

The third step in the NACHURS program utilizes a foliar application of slow release nitrogen during the reproductive stages applied as 1 - 2 gallons/acre of **NACHURS N-Rage®** at the R3 - R4 growth stage. As nitrogen fixation from nodules decreases after flowering, a foliar nitrogen application ensures that nitrogen is not a yield limiting factor during late reproductive stages. This helps to provide additional flowering on the top nodes and decreases pod abortion leading to higher yield.

Although each of these applications provide a benefit by themselves, putting all three steps together with solid base fertility levels as shown in Figure 2 can maximize the yield potential of today's soybean varieties. For more information please contact your local NACHURS DSM or Agronomist.

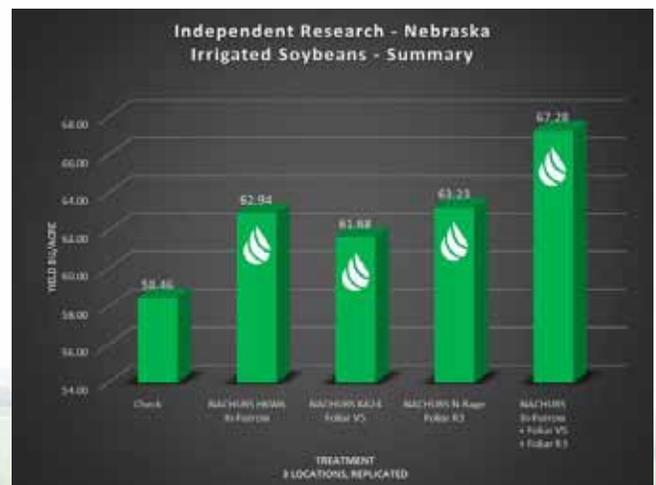


Fig. 2 – NACHURS Soybean program results. Average Soil Test Levels across locations: CEC 15-21, OM 2-4%, P1 74ppm, K 588ppm



PEANUT AND COTTON STARTER OPPORTUNITIES

By Keith Flaniken,
Southern Region Sales Agronomist- Tennessee

Yes, you can seed apply starter fertilizer directly onto peanuts and cottonseed, if some simple rules are followed.

Let's begin with Peanuts. Most producers choose to use a liquid inoculant at planting, especially in strip till situations or "new ground" situations. It is also recommended to use peanut inoculant if peanuts have been out of rotation for 3 years or more.

NACHURS has tested and marketed a tank mix of **NACHURS G24**® with inoculants such as Vault or Optimize for several years. A 1 gal/ac rate of **NACHURS G24**® tank mixed with inoculant at recommended rates in 5 gal or more of water, the results have been exciting. Observations include faster emergence, ground cover sooner, and flowering begins quicker.



1 gal/ac NACHURS G24



Check



Moultrie 2013

For Cotton, there are two options for seed applied NACHURS fertilizer. First, **NACHURS HKW18**® has long been the choice of cotton producers who choose to safely seed apply starter fertilizer onto cottonseed. The analysis of 3-18-18 and using the safest, highest quality of raw materials in the manufacturing process has proven to benefit by improving emergence, root development, and stand establishment. Secondly, a new blend in the field this year is **NACHURS HKW6**® powered by Bio-K™. This unique potassium acetate based NACHURS fertilizer has excited the market with its safety and plant response.

The safest way to apply either of these two starter fertilizers is to use a splitter on your distribution equipment. This will help spread the fertilizer onto the side walls as well as the bottom of the seed furrow. For either product, use no more than 2 gal/ac of fertilizer along with 3-4 gal/ac of water.

The benefit in offering your plants 100% available phosphorus at germination can help establish a healthy stand especially in cooler, wetter soils.

TOBACCO FERTILITY OPTIONS

By Daryl Clay,
Southern Region Sales Agronomist- Virginia

Tobacco is a North America crop. It provided one of the first regularly exported products that fueled the economy of a fledgling nation. Most consider tobacco a 'southern' crop and indeed the states that produce the most are North Carolina, Kentucky, Virginia, Tennessee, South Carolina and Georgia in that order. But tobacco is also grown in Pennsylvania, Ohio, Connecticut and Indiana. Twenty years ago my wife and I traveled to Tillsonburg, Ontario, Canada to visit my wife's relatives. I was surprised on that first visit as to the number of tobacco farms and flues I saw just thirty or so miles south of Toronto.

There are many different types of tobacco, but Aromatic Fire Cured, Bright Leaf (commonly referred to as Virginia tobacco regardless of where it is grown), and Burley (air cured) are the predominate types produced.

Tobacco is started in green houses and transplanted to fields at the appropriate time. It is a common practice to add fertilizer to the transplant water. NACHURS has many fertilizer formulations that are utilized in this manner. Formulations such as **NACHURS W18**® and **NACHURS W18-S**® at 1 gallon of product to 100 gallons water. A growing trend is to also add these same fertilizer products to the 'float' water which is the water the transplants are germinated in.

In addition, foliar feeding after transplanted in the field is a recommended

practice. NACHURS recommends foliar feeding of 1 – 2 gallons per acre of **NACHURS W18-S**® or **NACHURS W10-S**® at lay-by. Then applying 1 – 2 gallons of those formulations with an addition of calcium at topping. Keep in mind that NACHURS liquid fertilizers tank mix with many pesticides so if the tobacco crop is going to receive an application of a fungicide or insecticide that could provide a great opportunity to foliar feed the crop without having to make a separate trip across the field. If mixing products always follow the mixing instructions on the pesticide label. Through lab studies conducted by NACHURS Agronomists, we have found that generally to put the appropriate amount of water in the tank then add the pesticide to the tank water. We like to see the NACHURS liquid fertilizer to be added to the tank mix last.

Additional NACHURS liquid products that can be used to foliar feed a tobacco crop would include **NACHURS HKW18**® & **NACHURS HKW18-S**®, **NACHURS LKW20**®, and **NACHURS G24**® at lay-by. These products should be at 1 – 2 gallons per acre and the selection of a particular product would depend on nutritional needs of the crop based on soil and tissue samples.

By utilizing these products in the transplant water and foliar feeding the crop will develop leaves so thick that when held to the sunlight you cannot see the shadow of your hand showing through. Research from NCSU and Kentucky have shown that thicker, 'richer' leaves actually cure faster and more evenly than leaves not as healthy.

Employing the NACHURS recommended Tobacco fertilizer practices utilizing NACHURS high quality products will result in increased quality tonnage for tobacco producers.

FOLIAR FEEDING YOUR WHEAT

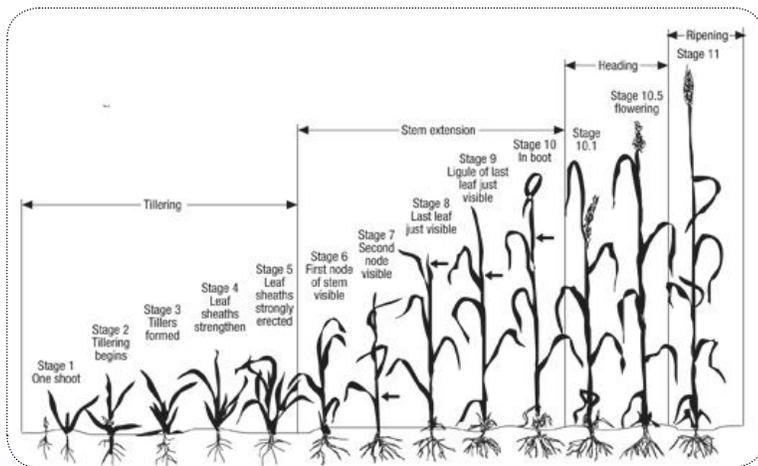
By Joe Osterhaus,
Northern Region Sales Agronomist- Nebraska

By the time you read this article, the wheat will be top-dressed with nitrogen and sulfur and weeds should have been sprayed. Now it's time to sit back and watch it grow. Or is it? Now is the time to manage for maximum yield. How many of you are taking tissue samples to see if the wheat has the nutrients it needs to maximize those yields? How many of you are scouting for diseases and insects? These are just two examples of practices to help achieve maximum yield.

Another practice is a foliar fertilizer application. Wheat sets its yield fairly early in the season, so we need to check nutrient levels to make sure we are in good shape. In a 2006 study done at Oklahoma State University researchers found that a foliar fertilizer application early at the Feekes 7 growth stage had higher yield results than a foliar application later when the wheat heads out at Feekes 10.5. These results support NACHURS findings that the best time for foliar feeding your wheat crop is from tillering through flag leaf. A good practice is to submit a tissue sample through the NACHURS sampling program and find out what your crop needs before you make a foliar application.

NACHURS N-Rage® is a great slow release nitrogen product that also contains phosphate, potassium and manganese that has proven results when used at 1-2 gallons per acre. **NACHURS N-Rage®** mixes well with fungicides and can be applied through flag leaf. **NACHURS K20-N®** is another foliar product containing a small amount of slow release nitrogen, a healthy dose of soluble potassium, as well as sulfur, boron, calcium and manganese. **NACHURS K20-N®** can be applied from tillering through early boot stage at 1-2 gallons per acre.

Foliar fertilizing crops is a great way to boost yield, correct deficiencies, and supplement crop nutrient needs. Call your NACHURS Agronomist or DSM with any questions. We have the products you want.



YOUR NACHURS AGRONOMY TEAM For more information, please visit www.nachurs.com

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