From the Ground Up

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June 2008

Runoff Study Initiated

In April, Soil Solutions cooperated with the University of Nebraska-Lincoln to put out small plots to measure runoff comparisons between gypsum applied at two rates and an untreated check. The runoff water is collected from each plot into the tanks shown in the picture to the left. The amount of runoff water will be compared between treatments. The water will also be analyzed to determine if there are differences in concentrations of nutrients. There have been similar studies done in other states. Those studies have shown a reduction in runoff and a lower concentration of nutrients where the gypsum has been applied. This means less nutrients leaving your fields and more available for crop use.

What's Happening in Your Corn Plants?

There is much more happening in your corn plants than meets the eye. All of the leaves, all of the stem nodes and all of the ears are initiated from cells produced during cell division in the apical meristem. This all occurs during the first three to four weeks and stops at about the time the collar of the fifth leaf becomes visible. This is about when corn is knee high. After this point in development the apical meristem changes from an area of cell division to an embryonic tassel. Usually about eight ears will develop on each corn plant. The uppermost of these eight ears will become the dominant ear and will produce nearly all of the grain. Crop stresses can affect the ear size factors. These are number of rows of kernels, the number of kernels in each row and the weight of each kernel. The number of potential kernels per row is determined from about the 10 leaf to

the 17 leaf stage. In addition to plant stress during this stage, ear length can also be reduced by plant density. Corn hybrids differ in the amount of ear "flex" (ear length response to weather conditions and agronomic practices).

Corn plants produce two root systems, both of which are initiated during the first four weeks of development. The primary root system consists of three pairs of seminal roots and the radical. These roots nourish the young seedling, but their growth nearly ceases by the three leaf stage. The secondary roots are comprised of adventitious roots that form on stem nodes both below and above ground. The first node of roots forms at about 1 ¼ inches below the soil surface. Each node of roots forms above this one. These roots are the major root system after the four leaf stage. Having good soil conditions in this area are critical for these roots to develop quickly. If not, plants will fall over due to a lack of supporting roots. Sidewall compaction can reduce root development and increase plant stress which can affect the yield components discussed earlier.

Understanding Foliar Applications

There are many differences of opinions on foliar applications of nutrients among agronomists. In general, foliar applications in field crops are still in its infancy. Below are some helpful tips to making your foliar program successful.

- Have your soil tested….know your most limiting factor nutritionally.
- Calcium levels should be at least 70% base saturation and Ca/Mg ratios of 5/1. If magnesium in your soil exceeds 25% foliar feeding results with any type of fertilizer may be disappointing.
- If temperature + humidity is greater than 140 do not foliar feed the crop until the temperature or humidity drops.
- Use high pressure, small droplets.
- When using ground equipment, apply 8 gallons of solution per acre. Never apply more than 3 gallons of a fertilizer blend within the 8 gallons of solution.
- When using aerial application, apply 2-4 gallons of solution per acre. With an aerial application be certain the fertilizer blend does not make up more than 50% of the spray solution.
- Citric acid used in with the foliar fertilizer has improved foliar nutritional response in corn. This is especially true if your source of water is chlorinated or if you have high pH water.
- Add ½ lb. of sugar per acre to enhance the response. Sugar will enhance bacterial activity on the leaf surface which increases nutrient absorption. Humates will increase fungal activity also enhancing nutrient absorption. Both also work as a buffer of the spray solution.
- Using a urea based fertilizer or adding some low biuret urea will enhance the uptake of nutrients.
- When foliar feeding use a complete fertilizer with all micronutrients.
- In general, foliar responses to phosphorus and potassium are greater with earlier applications. Crops in the mid and late stages of development respond to foliar applied nitrogen.

- Foliar feeding is not a substitute for root feeding, it is a supplement.

Foliar on Corn

- 1st Application: V4 to V5 stage; apply 2 qts. of 10-10-10 or 3-18-18 plus micronutrients.
- 2nd Applicaton: V8 to V10 stage; apply 2 qts. of 10-10-10 or 3-18-18 plus micronutrients.
- 3rd Application: Pre Tassel: 1-2 gallons of 26-0-0 plus 1 to 2 qts. of 10-10-10.

Foliar on Soybeans

- 1st Application: Early bloom initiation; apply 2 qts. to 2 gallons (depending upon needs) of 10-10-10 or 3-18-18. Include complete micronutrient package including boron and molybdenum.
- 2nd Application: Early pod set; 2 qts. to 2 gallons of 10-10-10 or 3-18-18.
- 3rd Application: Pod fill; 1 to 2 gallons of 26-0-0 plus 1 to 2 qts. of 10-10-10.

Foliar on Alfalfa

- 1st Application: After 1st cutting with about 1 in. of new growth; Apply 2 to 2.5 gallons of 10-10-10 plus 1 qt. of boron plus 1 lb. of sugar. If zinc levels are low include 1 qt. of zinc.
- 2nd application: After 3rd cutting with about 1 inch of new growth; Apply 2 gallons of 10-10-10 plus 1 pt. of boron plus 1 lb. of sugar.

Soil Solutions Employees do a Great Job!

Once again our employees at Soil Solutions have performed above and beyond to move a record amount of PRO CAL 40 this season. We hope our customers appreciate the long hours and the inclement weather conditions that our employees work in most of the winter to "get the job done". This winter was long and brutal and there were many days our truck drivers were driving on icy and treacherous roads and our applicator drivers were braving severe wind chills and snowy conditions, but they persevered. We hauled and applied product from Watertown, South Dakota to the Kansas border and from North Platte, Nebraska to Guthrie Center, Iowa. In addition, loads of PRO CAL 40 went as far as Joplin, MO, Dubuque, Iowa, Longmont, Colorado and Rapid City, South Dakota. We will take a little space in this newsletter to introduce you to our staff and recognize our employees.

Applicator Drivers: Ron Hanks, Kenny Eveleth, Clarence Phipps
Truck Drivers: Rodney Peasley, Gary Klein, Jason Holstein, Reuben Keller, Tim Cleaver, Mike Erdman and Mark Jonas.
Dispatcher: Kris Toman
Mechanic: Dave Breshnahan
Product Conditioning and Truck Loading: Richard Folsom
Marketing Rep: Gene Kenkel

Office Manager: Vickie Heck
Operations Manager: Dale Ronfeldt
Agronomist/Marketing: Bob Hecht
General Manager: Kevin Heck

(In addition, we use numerous contract trucking firms to supplement our own trucking fleet so that we can move product effectively during the peak spreading periods. We do appreciate their efforts as well.)

We hear many favorable comments from our customers about our employees and we want you to know that we do appreciate any feedback from you and we try to pass it along to the employees.

Of course, these employees know that they wouldn't have a job if it wasn't for you, the customer. We thank you for your business this past year and we look forward to continuing to serve you this coming year. We wish you the best during this summer growing season!!

Has your email changed?
Please notify the Soil Solutions office if your email address has changed. We will make the corrections in our database so that you won't miss any future newsletters. Also, if you are currently getting this letter by mail please send us your email address to vickie@ruralwaves.us so that we can email this letter to you instead. This all helps in holding down our costs and giving you a more economical product.

Comments Appreciated
If you have any comments regarding this newsletter or have suggestions for topics for future newsletters please email b_hecht@bbwi.net.